EXHIBIT C

SNIK LLC v. SAMSUNG ELECTRONICS CO., LTD., et al.
EDTX Case No. 19-cv-00387 JRG
Preliminary Infringement Contentions re
U.S. Patent No. US9167329B2

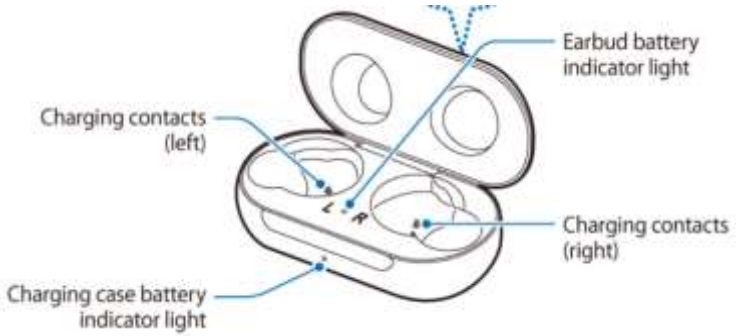
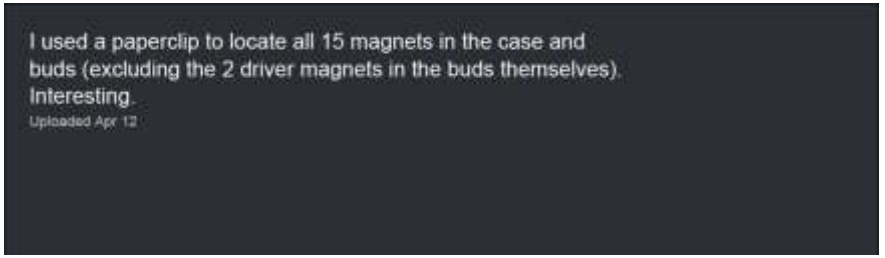
US9167329B2

I. Asserted claims:
   a. 1, 5, 7, 10, 12-14, 22, 36-42, 54-55
II. Accused apparatus, products, devices, processes, methods, acts or instrumentalities:
   a. Samsung Galaxy Buds; Samsung Galaxy Buds+ (also styled Samsung Galaxy Buds Plus)
III. Snik LLCis informed and believes that the accused products, devices, processes, methods, acts or instrumentalities infringe either literally or through the doctrine of equivalents.
IV. US9167329B2 claims priority to provisional application Ser. No. 61/601722, filed on February 22, 2012, which is incorporated herein by this reference
V. References:

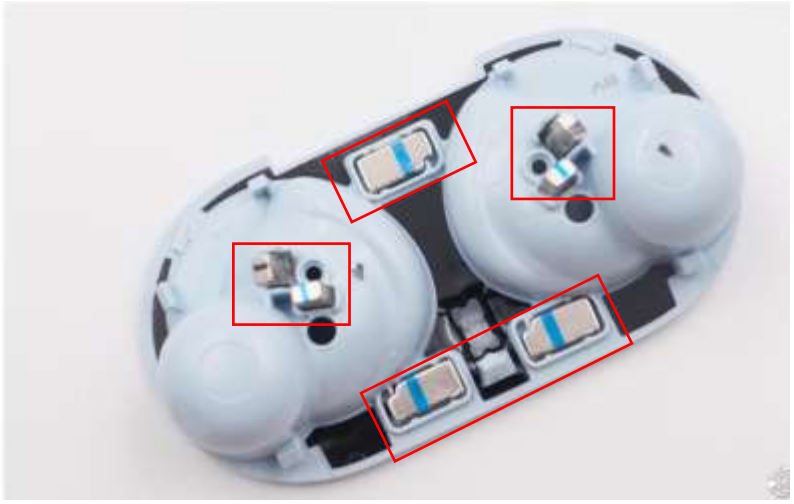
[1] http://downloadcenter.samsung.com/content/MC/201902/20190221105505228/EB/Len/start_here.html
[2] https://www.inverse.com/article/53923-galaxy-buds-airpods-samsung-rival
[3] https://imgur.com/RoKlYKl
[4] https://www.broadcom.com/company/news/product-releases/2389392
[5] https://www.samsung.com/global/galaxy/galaxy-buds/specs/
[6] https://www.samsung.com/global/galaxy/galaxy-buds/
[7] https://www.samsung.com/us/mobile/audio/galaxy-buds/?cid=sem-mktg-pfs-aacc-22019-22493&gclid=EAIaIQobChMIm87h3M-h5QIVEsRkCh21hgQBEAAYASAAEgKrUPD_BwE&gclsrc=aw.ds
[8] https://news.samsung.com/global/hands-on-review-of-the-all-new-galaxy-buds
[9] https://www.samsung.com/us/mobile/audio/galaxy-buds/
[10] http://www.mytechgadgetnews.com/what-does-the-apple-h1-chip-imply-for-audio-do-android-customers-have-an-alternate/
[11] https://www.samsung.com/au/support/mobile-devices/using-the-samsung-galaxy-buds/
[12] https://www.samsung.com/us/support/answer/ANS00078137/
[13] https://9to5mac.com/2019/03/14/samsung-galaxy-buds-vs-apple-airpods/
[14] http://www.52audio.com/archives/24983.html
[15] http://www.topbluetoothheadphone.com/e-tears-open-solution-galaxy-buds-tears-open-solution-to-go-up-earphone-tears-open-solution.html
[16] https://www.youtube.com/watch?v=vRZNXa1bozA

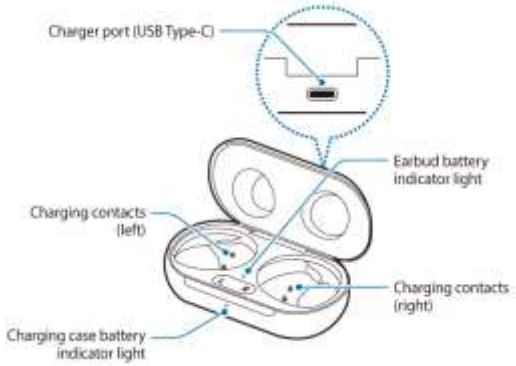
[17] https://www.sammobile.com/news/galaxy-buds-plus-teardown-confirms-most-repairable-tws/
[18] https://www.samsung.com/us/mobile/audio/galaxy-buds-plus/specs/
[19] https://www.samsung.com/us/mobile/audio/galaxy-buds-plus/
[20] https://www.samsung.com/us/support/owners/product/galaxy-buds-plus
[21] http://downloadcenter.samsung.com/content/UM/202003/20200306230854916/WEA_SM-R175_Galaxy_Buds_Plus_EN_IBG_030420_FINAL.pdf
[22] https://www.samsung.com/global/galaxy/galaxy-buds-plus/specs/
[23] Teardown Photographs Taken on 04/12/2020 and 05/14/2020
[24] Galaxy Buds+ User Manual at http://downloadcenter.samsung.com/content/MC/202003/20200318123539528/EB/Len/003_basics_3.html#1
[25] https://www.samsung.com/us/mobile/audio/galaxy-buds-plus/?cid=sem-mktg-pfs-aacc-us-google-na-03012020-169931-&ds_e=GOOGLE-cr:0-pl:268643744-&ds_c=FF~Galaxy+Buds+-+Core+Brand_CN~GBP_PH~on_MK~usnat_BS~me_PR~wiaud_SB~galbup_PK~CPL_FS~lo_CA~kew_MD~h_KS~ba_MT~bmm-&ds_ag=AG~Samsung+Galaxy+Buds_MK~usnat_AT~ta_MD~h_AI~No-&ds_k=%2Bsamsung+%2Bgalaxy+%2Bbuds&gclid=EAIaIQobChMIv4aCrIPm6AIV3x-tBh3m1QZ6EAAYASAAEgIYPvD_BwE&gclsrc=aw.ds
[26] http://downloadcenter.samsung.com/content/MC/202003/20200318123539528/EB/Len/004_using-the-earbuds_5.html#0

Claim 1	Evidence
1[pre]. A system for holding a set of earphones comprising:	The Preamble is non-limiting. *STX LLC. v. Brine*, 211 F.3d 588, 591, 54 USPQ2d 1347, 1350 (Fed. Cir. 2000) (preamble that states a purpose or intended use for the invention is not limiting).

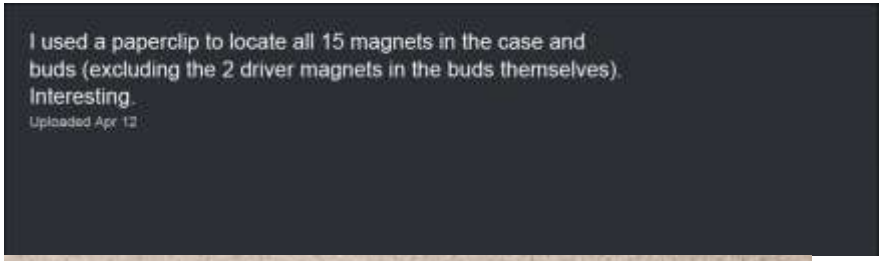
1[a] a holder body comprising one or more magnets;	Samsung Galaxy Buds comprise a charging case with one or more magnets:  [1] Galaxy Buds: Features The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go. [2] 

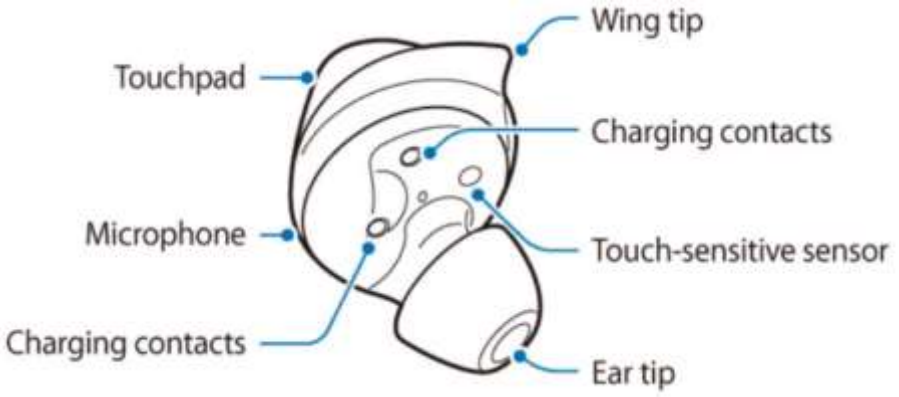
[3]



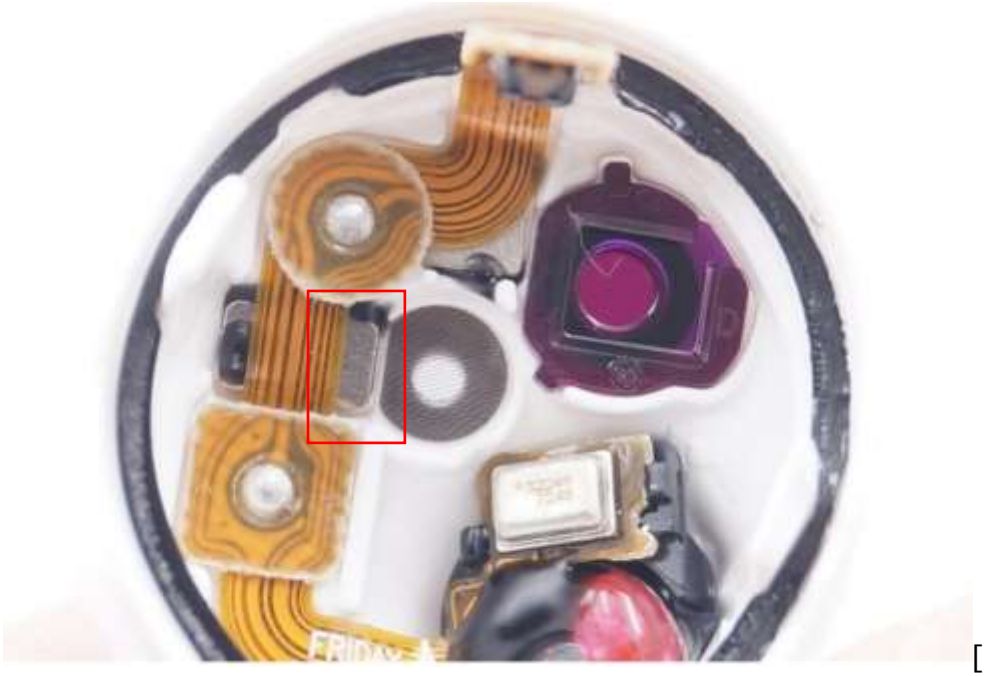
	采用多颗磁铁辅助耳机定位。 [14] English Translation: Use multiple magnets to assist in headphone positioning Samsung Galaxy Buds+ comprise a charging case with one or more magnets:  [24]  [23]

	 [23]

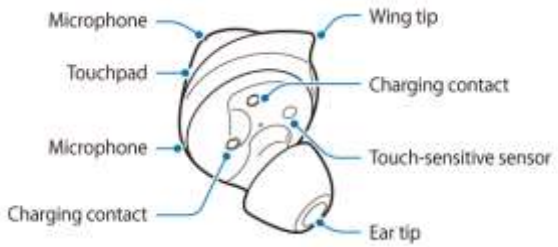
1[b] a set of earphones comprising a magnetically attractable surface for removably coupling with the one or more magnets; and	Samsung Galaxy Buds comprise a set of earphones with magnetically attractable surfaces for removably coupling with the one or more magnets: Galaxy Buds: Features The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go. [2]   [3]


Wing tip
Touchpad
Charging contacts
Microphone
Touch-sensitive sensor
Charging contacts
Ear tip

[1]

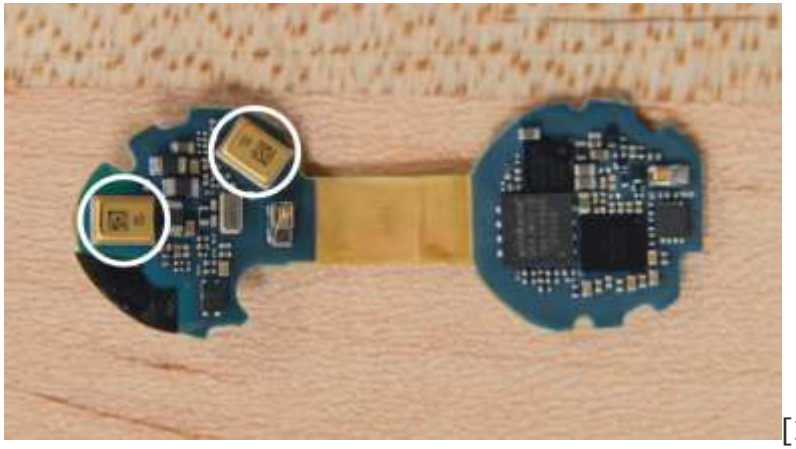


[14]

	Samsung Galaxy Buds+ comprise a set of earphones with magnetically attractable surfaces for removably coupling with the one or more magnets:  [24] Your device contains magnets, which may affect medical devices, such as pacemakers or implantable cardioverter defibrillators. If you are using any of these medical devices, keep your device a safe distance from them and consult with your physician before you use the device. [24]  [16]

[16]

The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]



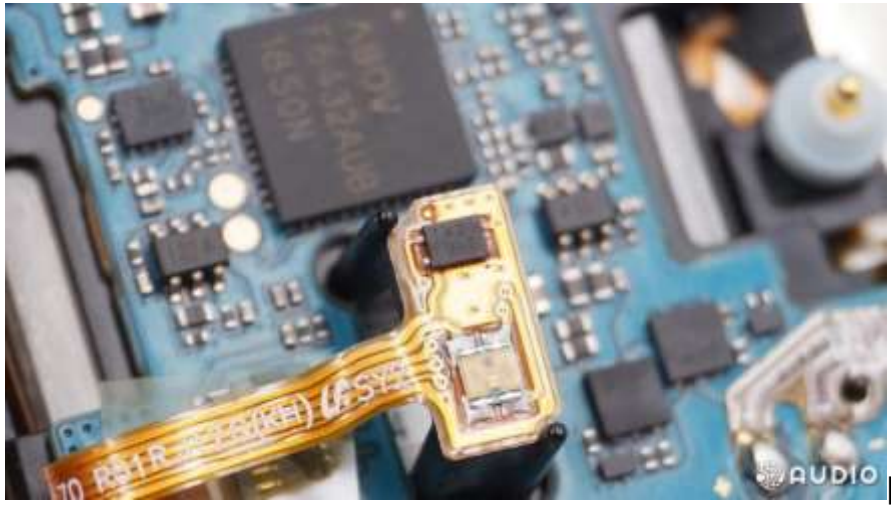
[16]

1[c] an electronic device controller coupled to receive an activation signal when one or more of the set of earphones are decoupled from one of the one or more magnets, wherein the electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one of the or more of the magnets.	Samsung Galaxy Buds comprise an electronic device controller coupled to receive an activation signal when one or more of the set of earphones are decoupled from one of the one or more magnets: **Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds** **Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint** SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4] Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that: • Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound. • Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience. • Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques. • Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer. • Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds. • Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials. [4] Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

	 [14] On information and belief, the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip and are responsive to a magnetic Hall sensor:

Samsung Galaxy Buds - The Official Samsung Galaxy Site

[5]



[14]

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

[8]

Also, Samsung Galaxy Buds detect if one or more earbuds are decoupled from one or more of the magnets comprising the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnets comprising the holder body, the music stops automatically.

The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.

[11]

The electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one or more of the magnets. When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds earphones are deactivated and cannot play audio when in the holder.

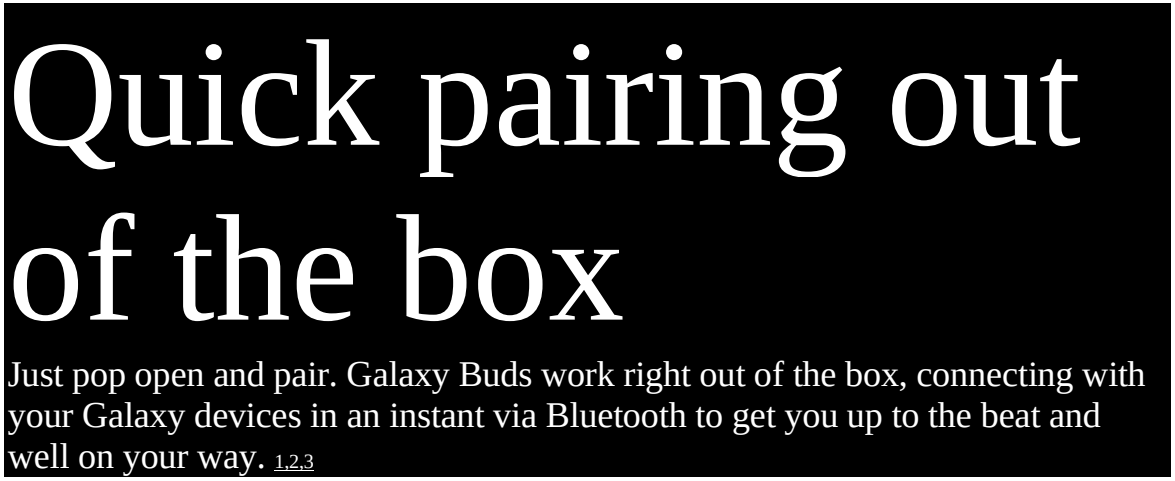
[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

[8]

On information and belief, Galaxy Buds are compatible with Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, and Galaxy S10e.

[5]



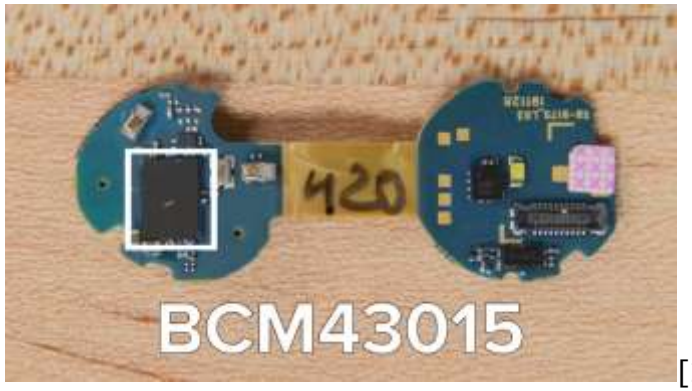
[6]

On information and belief, Galaxy Buds are also compatible with other smartphones, including without limitation Apple iPhones, which also include a controller for receiving Bluetooth signals.

[7]

When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds earphones activate and begin playing audio when removed from the charging case.

Samsung Galaxy Buds+ comprise an electronic device controller coupled to receive an activation signal when one or more of the set of earphones are decoupled from one of the one or more magnets:



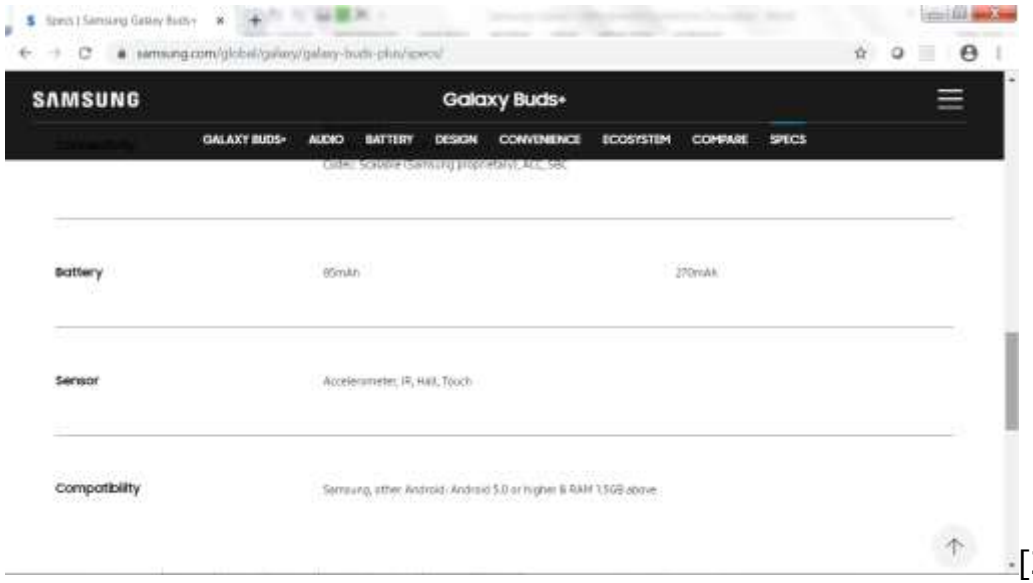
[16]

Galaxy Buds+ also include Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.

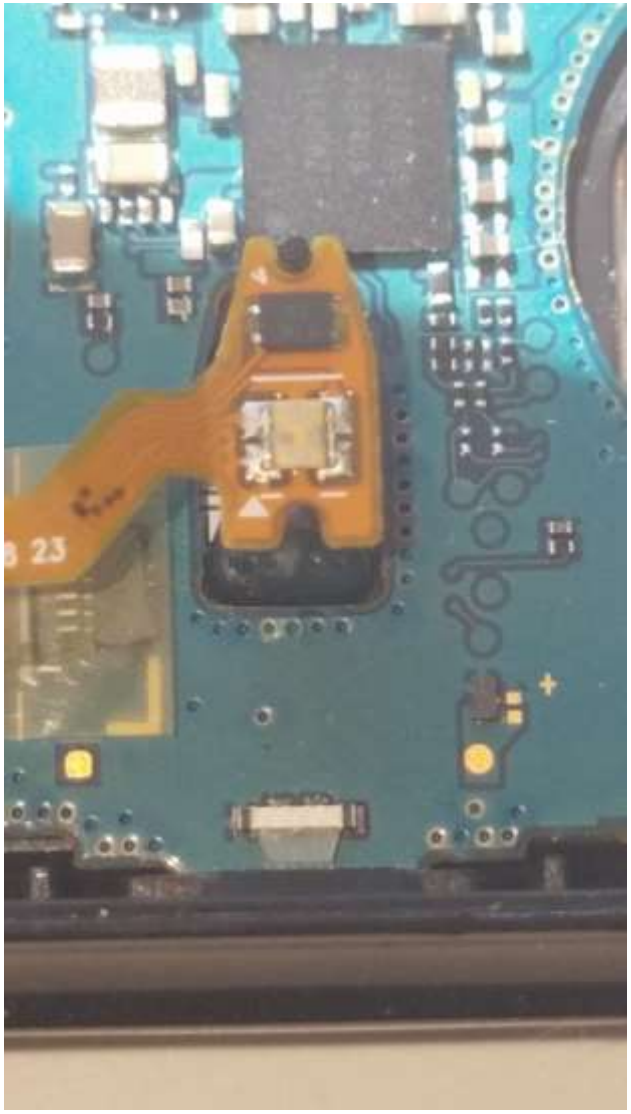
[23]

On information and belief, BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the control unit and sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

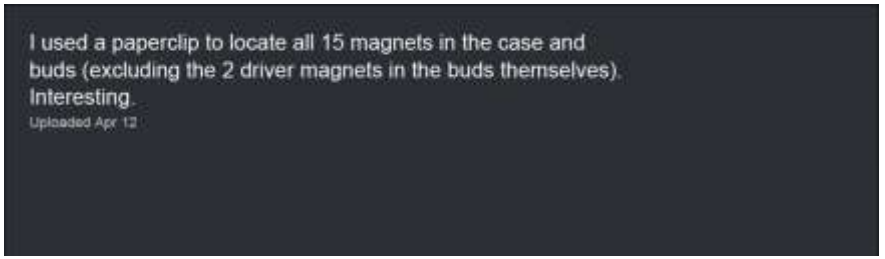
	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]


SAMSUNG
Galaxy Buds+
GALAXY BUDS+
AUDIO
BATTERY
DESIGN
CONVENIENCE
ECOSYSTEM
COMPARE
SPECS
Battery
Sensor
Compatibility

[22]

	 [23]

	Also, Samsung Galaxy Buds+ detect if one or more earbuds are decoupled from one or more of the magnets comprising the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnets comprising the holder body, the audio stops. The electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one or more of the magnets. When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds+ earphones are deactivated and cannot play audio when in the holder. Galaxy Buds+ are compatible with smartphones and tablets running Android 5.0 or higher, including without limitation Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, Galaxy S10e, S20, S20+ and S20 Ultra 5G. In addition, Galaxy Buds+ are compatible with iPhone7 or later models with iOS10 of higher. [10] Compatible with smartphones and tablet running Android 5.0 or higher and with more than 1.5GB of RAM. Also compatible with iPhone7 or later models with the iOS 10 or higher. [25]
Claim 5	Evidence
5. The system of claim 1 wherein the magnetically attractable surface is non-removable.	Samsung Galaxy Buds comprise a set of earphones with a magnetically attractable surface that is non-removable:

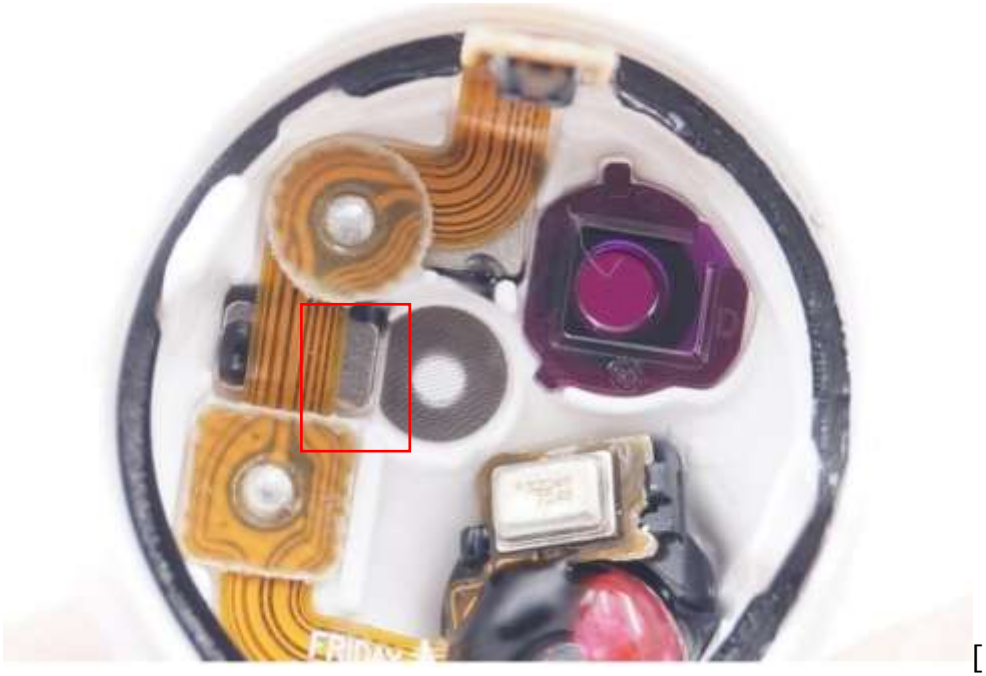
	Galaxy Buds: Features The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go. [2] 

 [3]

As with the AirPods, Samsung's wireless headphones employ the use of magnets to align the buds perfectly to the charging contacts inside the case, while keeping them secure in the case upon opening the top cover.

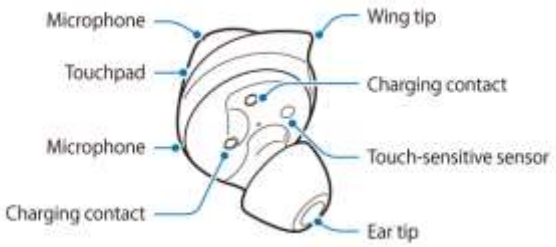
The charging case features a pair of contacts for each earbud that aligns with the two contacts on the Galaxy Buds. Thanks to the magnetic alignment, users can simply place the buds inside the charging case and rest assured knowing that they'll begin charging automatically.

[13]



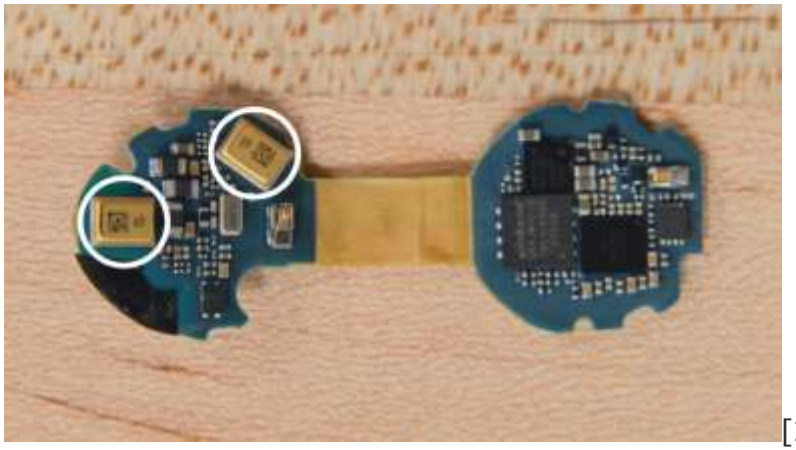
[14]

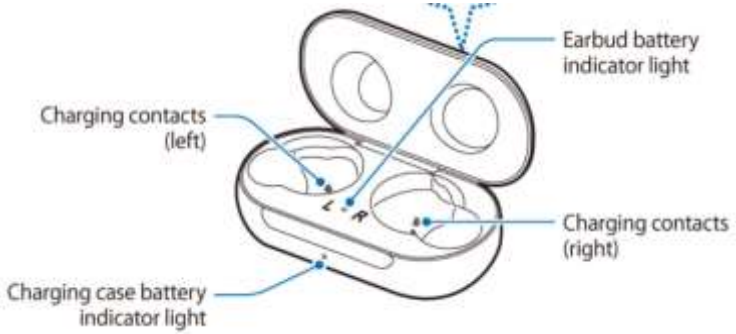
Samsung Galaxy Buds+ comprise a set of earphones with magnetically attractable surface that is non-removable:



[24]

	Your device contains magnets, which may affect medical devices, such as pacemakers or implantable cardioverter defibrillators. If you are using any of these medical devices, keep your device a safe distance from them and consult with your physician before you use the device. [24]  [16]  [16]

	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]
Claim 7	Evidence
7. The system of claim 1 further comprising one or more additional magnets.	Samsung Galaxy Buds comprise a charging case with one or more magnets:



[1]

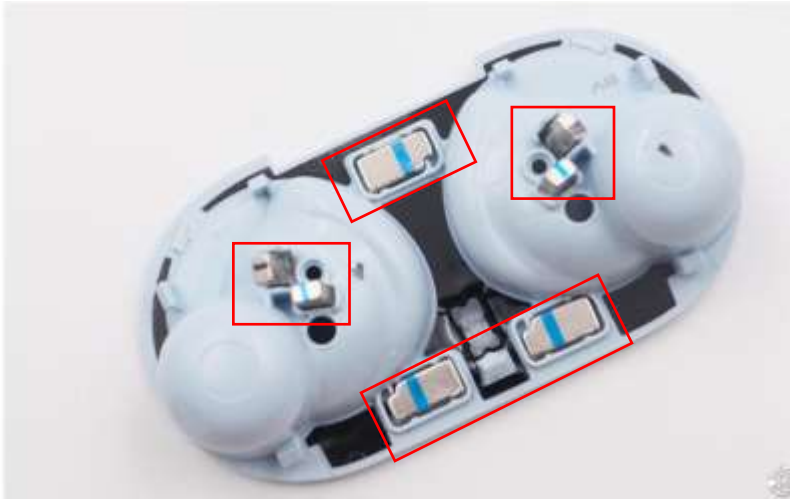
Galaxy Buds: Features

The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go.

[2]

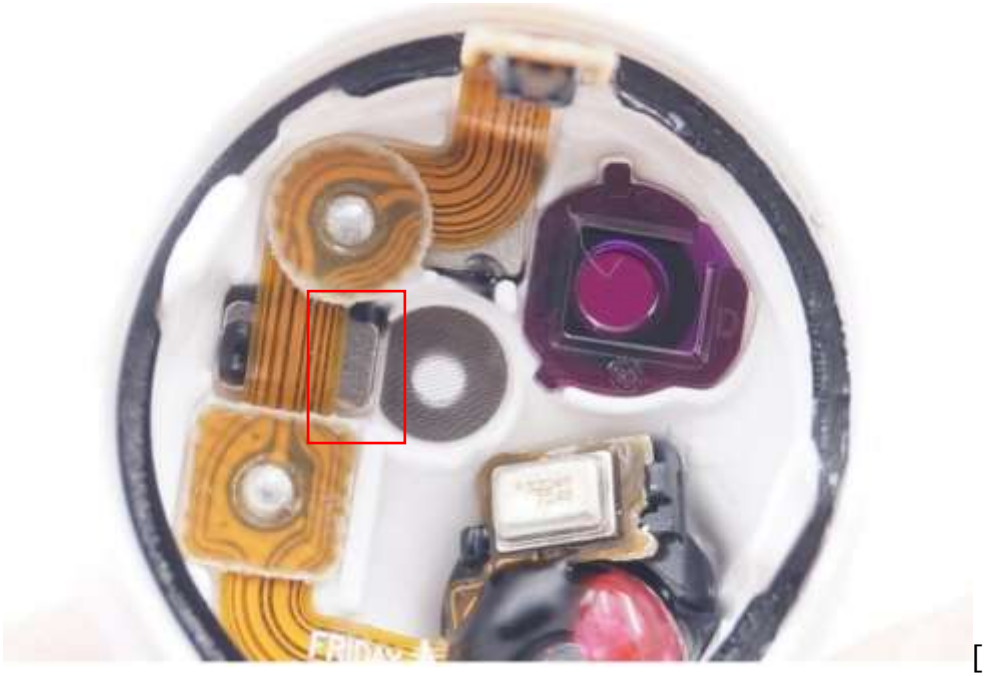
I used a paperclip to locate all 15 magnets in the case and buds (excluding the 2 driver magnets in the buds themselves). Interesting.
Uploaded Apr 12

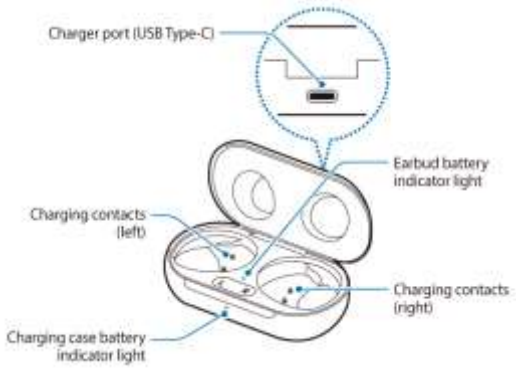
[3]



采用多颗磁铁辅助耳机定位。

[14]

	English Translation: Use multiple magnets to assist in headphone positioning Galaxy Buds earphones include one or more additional magnets:  [14] Samsung Galaxy Buds+ comprise a charging case with one or more magnets:

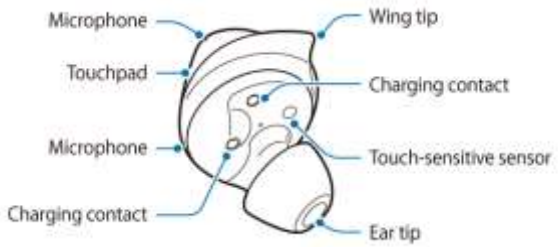

Charger port (USB Type-C)
Earbud battery indicator light
Charging contacts (left)
Charging contacts (right)
Charging case battery indicator light

[24]

[23]

[23]

Samsung Galaxy Buds+ comprise a earbuds with one or more magnets:



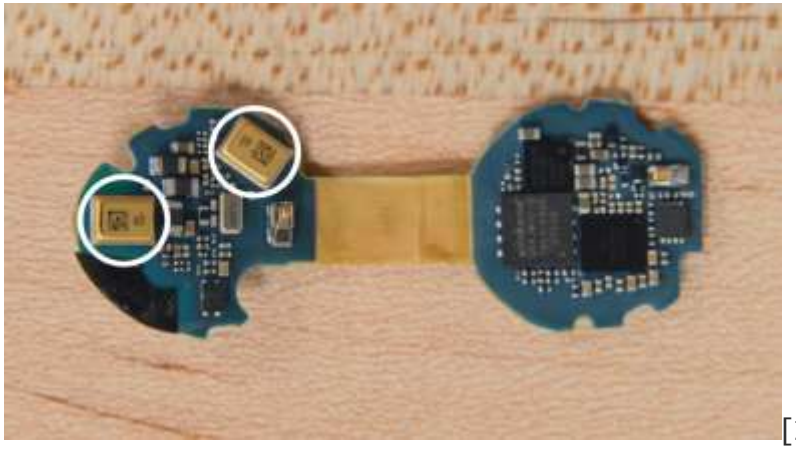
[24]

Your device contains magnets, which may affect medical devices, such as pacemakers or implantable cardioverter defibrillators. If you are using any of these medical devices, keep your device a safe distance from them and consult with your physician before you use the device. [24]

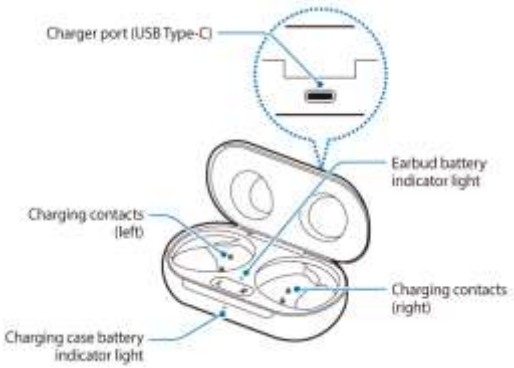
[16]

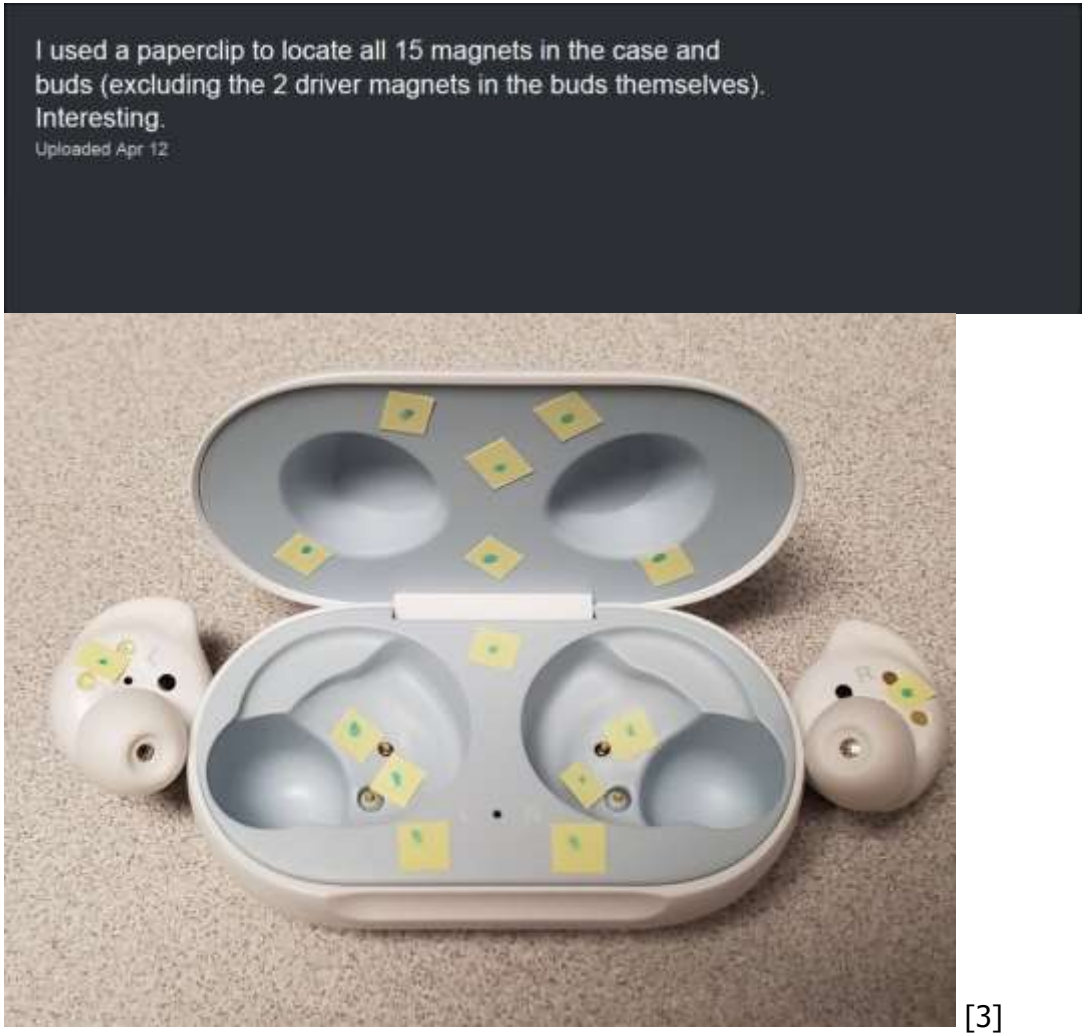

[16]

The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]

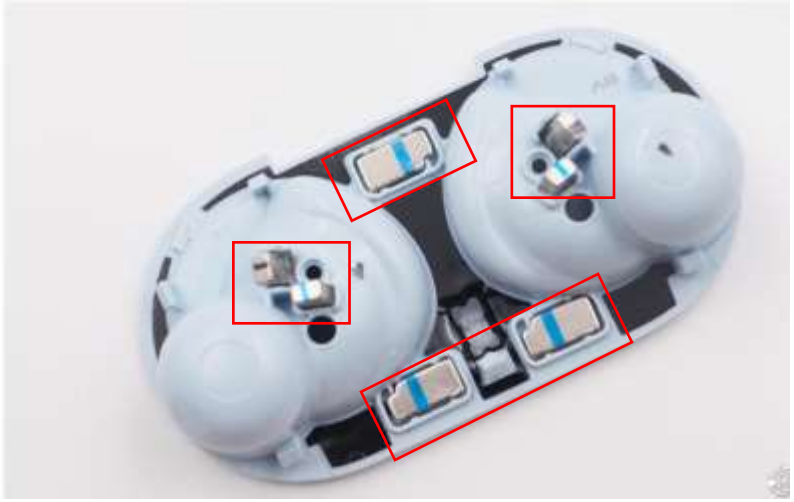

[16]

Claim 10	Evidence
10[pre]. An earphones holder comprising:	The Preamble is non-limiting. *STX LLC. v. Brine*, 211 F.3d 588, 591, 54 USPQ2d 1347, 1350 (Fed. Cir. 2000) (preamble that states a purpose or intended use for the invention is not limiting).
10[a]. a holder body;	Samsung Galaxy Buds comprise a charging case: **Power up to power on.** Get up to 13 hours[1] of battery life when you are on the go with a case that doubles as a wireless charger for your wireless earbuds. One full charge provides up to six hours[1] of play time and the charging case provides up to an additional seven hours.[1] Running low on power but in a rush to get out the door? A quick 15-minute charge in the case will get you up to 1.7 hours of play time.  [9] Samsung Galaxy Buds+ comprise a charging case:

	 [24]
10[b]. one or more holder magnetically attractable surfaces configured to magnetically couple to one or more earphone magnetically attractable surfaces coupled to one or more earphones; and	Samsung Galaxy Buds case comprises magnetically attractable surfaces configured to magnetically couple to one or more earphone magnetically attractable surfaces: Galaxy Buds: Features The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go. [2]


I used a paperclip to locate all 15 magnets in the case and buds (excluding the 2 driver magnets in the buds themselves). Interesting.
Uploaded Apr 12

[3]



采用多颗磁铁辅助耳机定位。 [14]

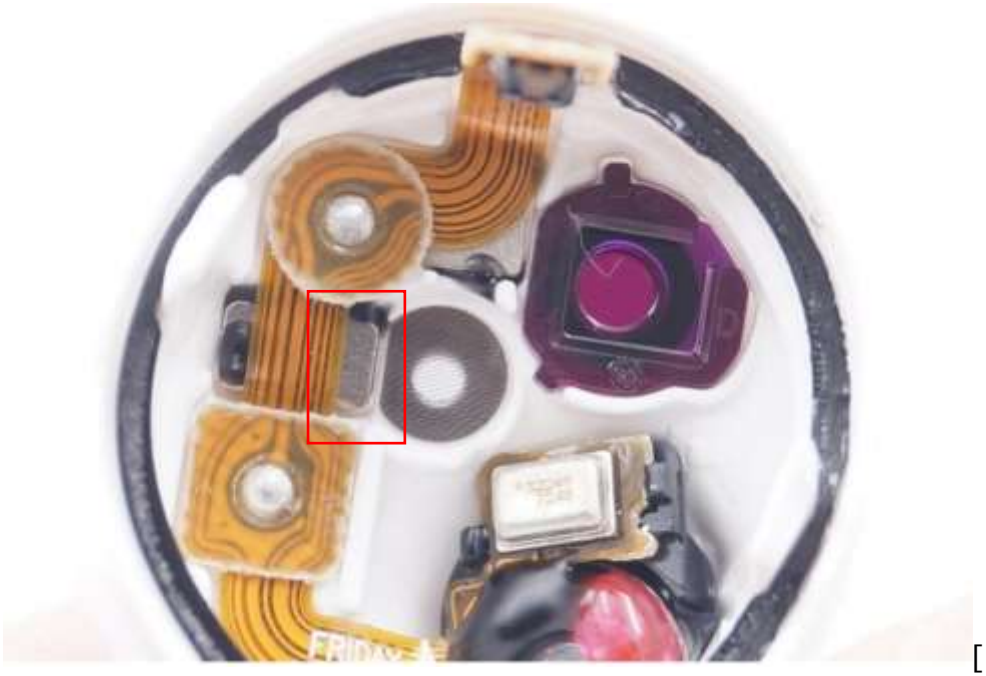
English Translation: Use multiple magnets to assist in headphone positioning

As with the AirPods, Samsung's wireless headphones employ the use of magnets to align the buds perfectly to the charging contacts inside the case, while keeping them secure in the case upon opening the top cover.

The charging case features a pair of contacts for each earbud that aligns with the two contacts on the Galaxy Buds. Thanks to the magnetic alignment, users can simply place the buds inside the charging case and rest assured knowing that they'll begin charging automatically.

[13]

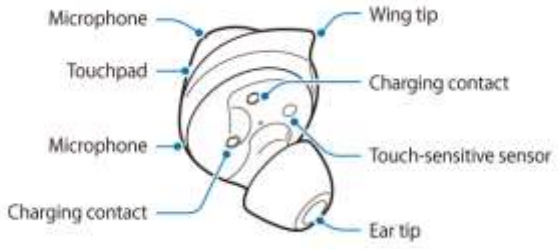
Samsung Galaxy Buds+ comprise a earbuds with one or more magnetically attractable surfaces:

	 [14] Samsung Galaxy Buds+ case comprises magnetically attractable surfaces configured to magnetically couple to one or more earphone magnetically attractable surfaces:

[23]

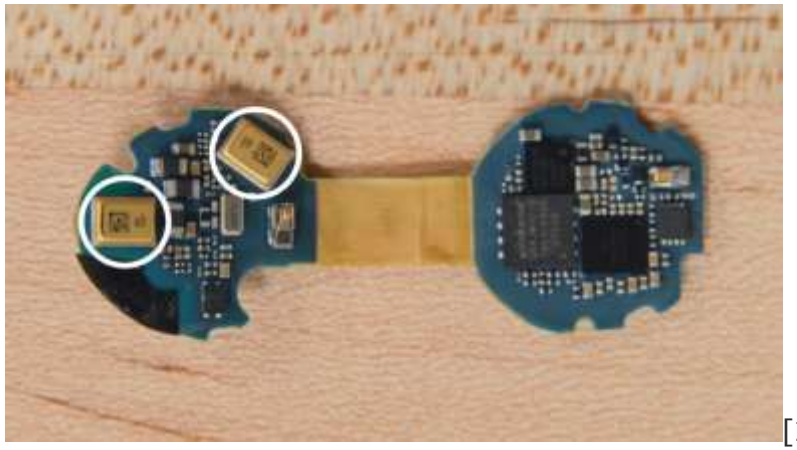
[23]

Samsung Galaxy Buds+ comprise a earbuds with one or more magnetically attractable surfaces:



[24]

	Your device contains magnets, which may affect medical devices, such as pacemakers or implantable cardioverter defibrillators. If you are using any of these medical devices, keep your device a safe distance from them and consult with your physician before you use the device. [24]  [16]  [16]

	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]
10[c]. an electronic device controller coupled to receive an activation signal when one or more of the earphone magnetically attractable surfaces are decoupled from one of the one or more holder magnetically attractable surfaces, wherein the electronic device controller receives a deactivation signal when one or more of the earphone magnetically attractable surfaces are coupled to one of the one or more holder magnetically attractable surfaces.	Samsung Galaxy Buds comprise, an electronic device controller coupled to receive an activation signal when one or more of the earphones magnetically attractable surfaces are decoupled from one of the one or more holder magnetically attractable surfaces:

Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds

Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint

SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4]

Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that:

- Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound.
- Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience.
- Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques.
- Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer.
- Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds.
- Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials.

[4]

Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

	 [14] On information and belief, the sensor hub of the BCM43014 System on Chip and the ABOV F6432AUB are responsive to a magnetic Hall sensor: On information and belief, the the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip is responsive to a magnetic Hall sensor:

Samsung Galaxy Buds - The Official Samsung Galaxy Site

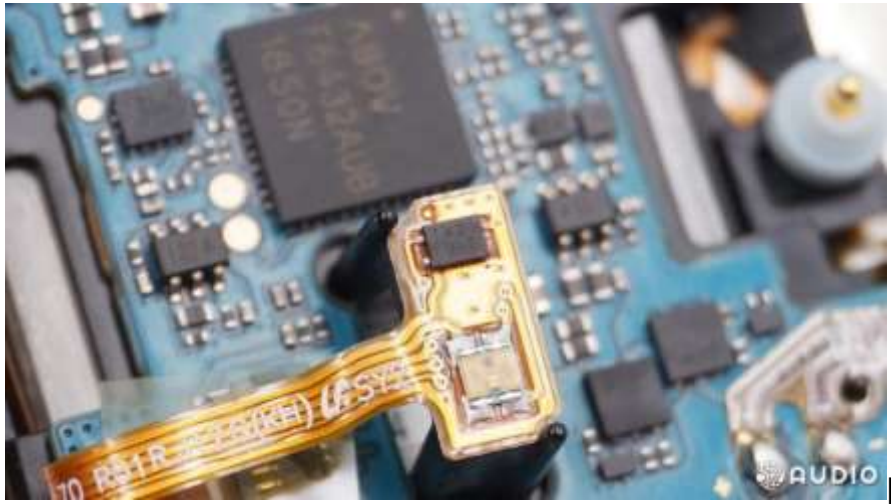
[5]

Broadcom BCM43014

Broadcom is an enormous identify within the wi-fi communications enterprise and has its personal vary of true wi-fi audio chips. The BCM43014 powers the Samsung Galaxy Buds, which had been introduced alongside the Samsung Galaxy S10 collection this 12 months.

The BCM43014 can also be a Bluetooth 5 chip, for what that's price, full with an audio DSP and sensor hub expertise for contact, IR, and proximity sensors. The chip helps quick scan and connection choices to enhance pairing pace. There's no ANC with the Galaxy Buds, however the BCM43014 mentions the combination of superior acoustic algorithms that cut back background noise, which might be out there to different items.

[10]



[14]

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

[8]

Also, Samsung Galaxy buds detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces attached to the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnetically attractable surfaces attached to the holder body, the music stops automatically.

The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.

[11]

The electronic device controller receives a deactivation signal when one or more of the earphones magnetically attractable surfaces are coupled to one of the one or more holder magnetically attractable surfaces. When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds earphones are deactivated, and audio stops automatically when in the holder.

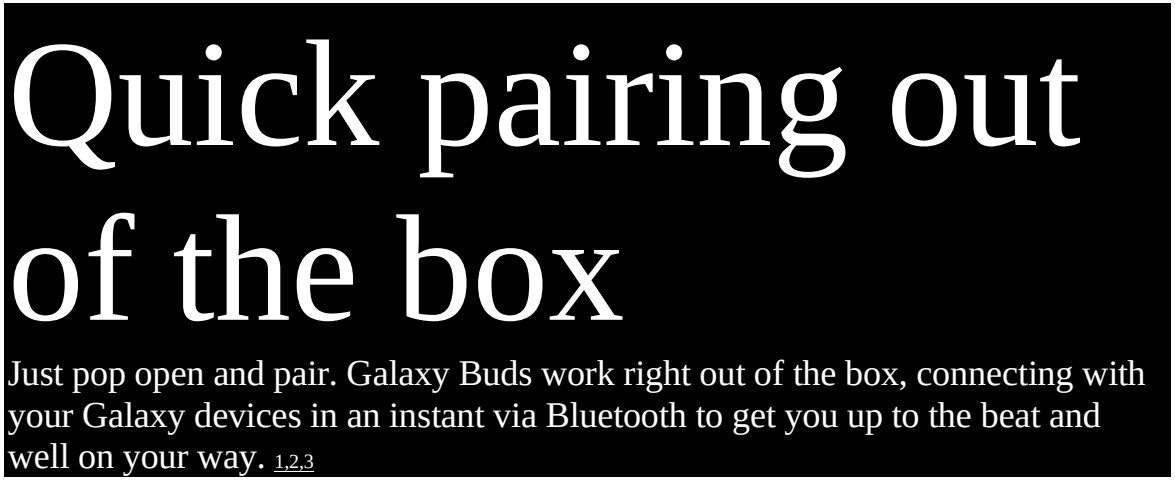
[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

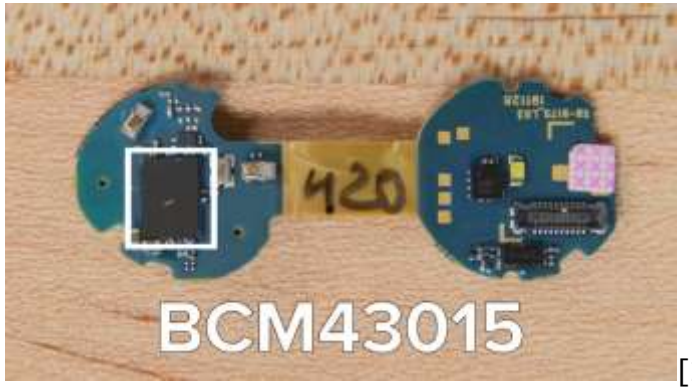
[8]

On information and belief, Galaxy Buds are compatible with Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, and Galaxy S10e.

[5]

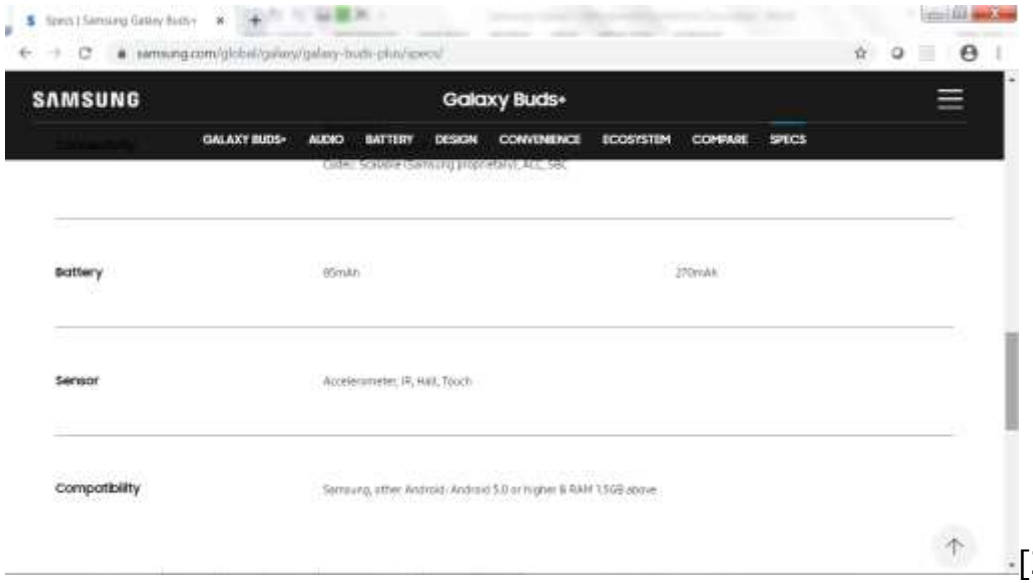


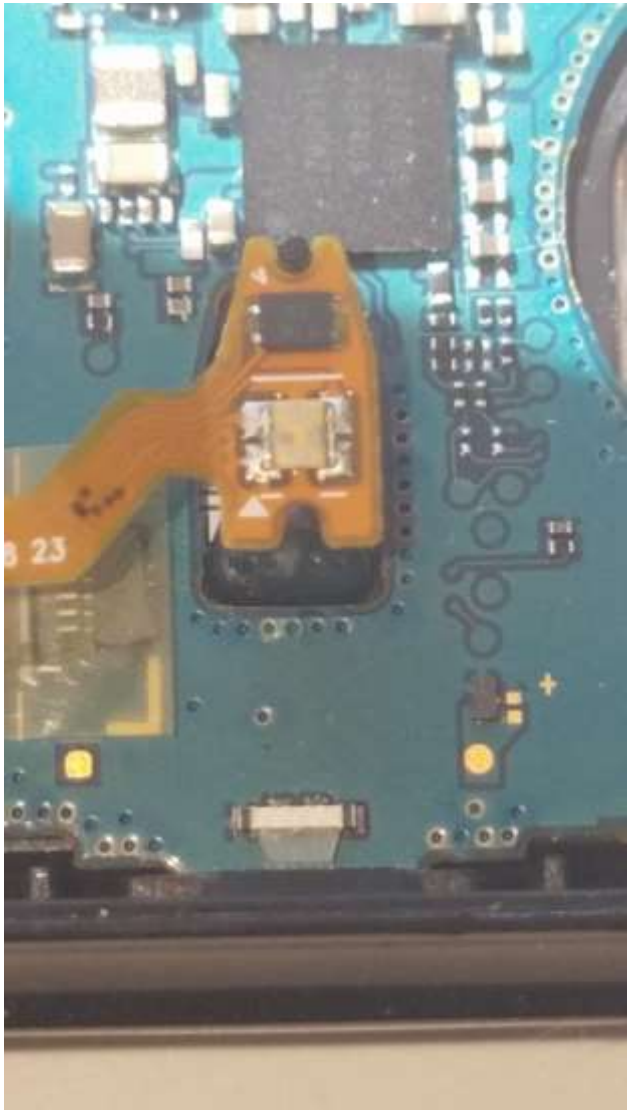
[6]

	On information and belief, Galaxy Buds are also compatible with other smartphones, including without limitation Apple iPhones, which also include a controller for receiving Bluetooth signals.  [7] Samsung Galaxy Buds+ comprise, an electronic device controller coupled to receive an activation signal when one or more of the earphone magnetically attractable surfaces are decoupled from one of the one or more holder magnetically attractable surfaces:  [16]

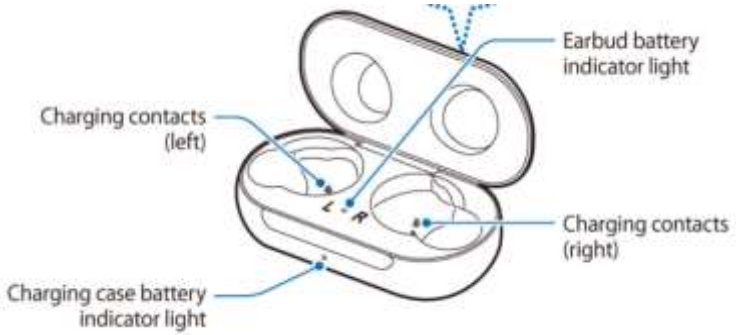
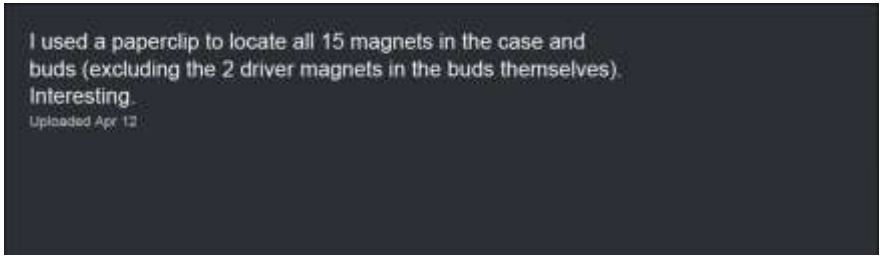
	Galaxy Buds+ also comprise Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.  [23] On information and belief, BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the controller and/or sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

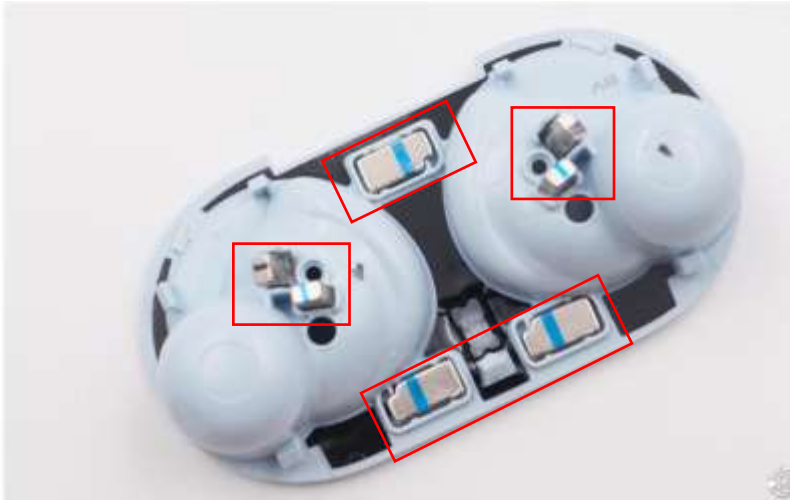
	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]

	 SAMSUNG Galaxy Buds+ GALAXY BUDS+ AUDIO BATTERY DESIGN CONVENIENCE ECOSYSTEM COMPARE SPECS Battery Sensor Compatibility [22]

	 [23]

	Also, Samsung Galaxy Buds+ detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces comprising the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnetically attractable surfaces comprising the holder body, the audio stops. The electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one or more of the magnetically attractable surfaces. When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds+ earphones are deactivated and cannot play audio when in the holder. Galaxy Buds+ are compatible with smartphones and tablets running Android 5.0 or higher, including without limitation Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, Galaxy S10e, S20, S20+ and S20 Ultra 5G. In addition, Galaxy Buds+ are compatible with iPhone7 or later models with iOS10 of higher. [10] Compatible with smartphones and tablet running Android 5.0 or higher and with more than 1.5GB of RAM. Also compatible with iPhone7 or later models with the iOS 10 or higher. [25]

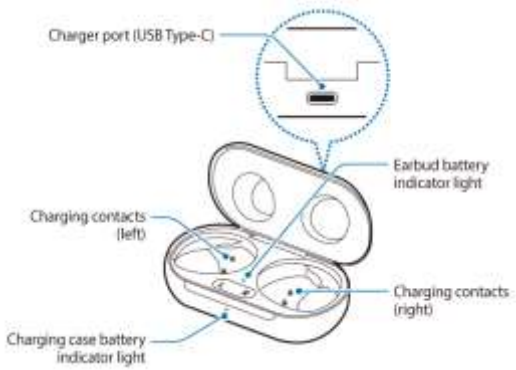
Claim 12	Evidence
12. The earphones holder of claim 10 wherein the one or more magnetically attractable surfaces comprise one or more magnets.	Samsung Galaxy Buds comprise a charging case with one or more magnetically attractable surfaces comprising one or more magnets:  [1] Galaxy Buds: Features The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go. [2] 

	 [3]
	

采用多颗磁铁辅助耳机定位。 [14]

English Translation: Use multiple magnets to assist in headphone positioning

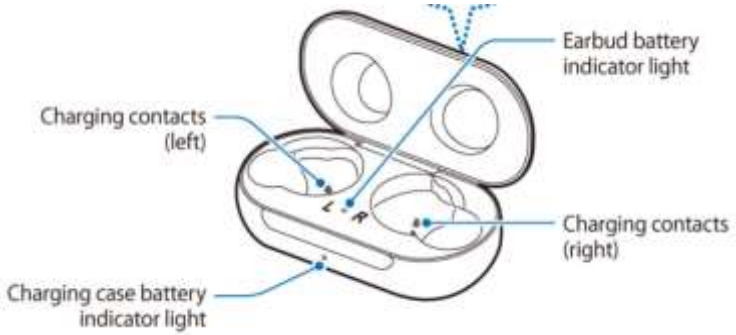
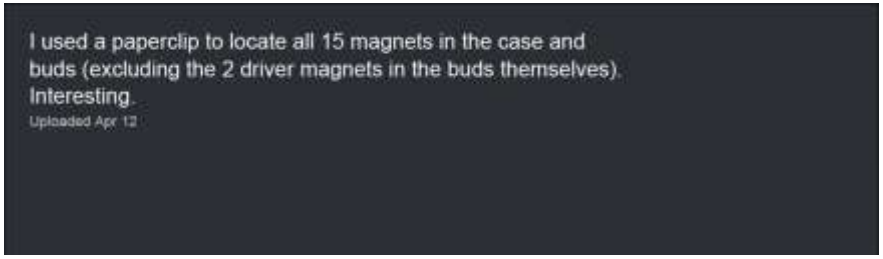
Samsung Galaxy Buds+ comprise a charging case with one or more magnetically attractable surfaces comprising one or more magnets:



[24]

[23]

	 [23]

Claim 13	Evidence
13. The earphones holder of claim 12 wherein the one or more magnetically attractable surfaces are configured for removably coupling with a metal part of an earbud.	Samsung Galaxy Buds comprise a charging case with magnetically attractable surfaces for removably coupling with a metal part of a Galaxy bud:  [1] Galaxy Buds: Features The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go. [2] 

	 [3]

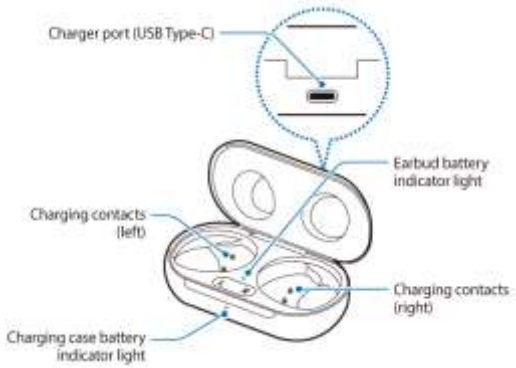
[14]

As with the AirPods, Samsung's wireless headphones employ the use of magnets to align the buds perfectly to the charging contacts inside the case, while keeping them secure in the case upon opening the top cover.

The charging case features a pair of contacts for each earbud that aligns with the two contacts on the Galaxy Buds. Thanks to the magnetic alignment, users can simply place the buds inside the charging case and rest assured knowing that they'll begin charging automatically.

[13]

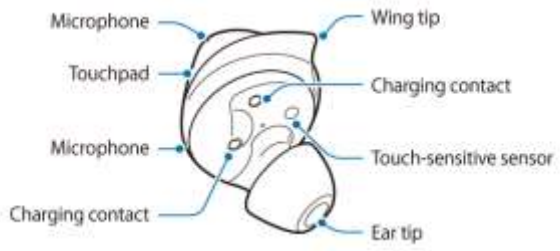
Samsung Galaxy Buds+ comprise a charging case with magnetically attractable surfaces for removably coupling with a metal part of a Galaxy Buds+:


Charger port (USB Type-C)
Earbud battery indicator light
Charging contacts (left)
Charging contacts (right)
Charging case battery indicator light

[24]

[23]

[23]



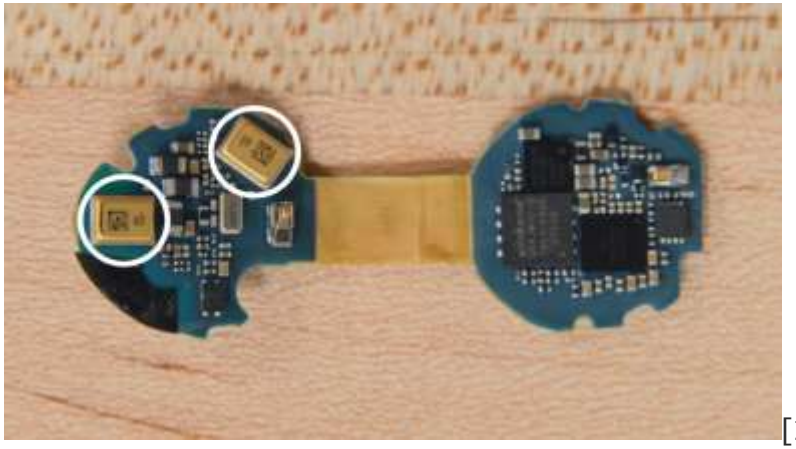
[24]

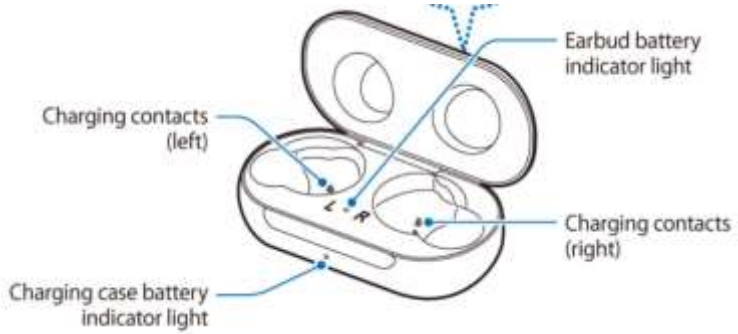
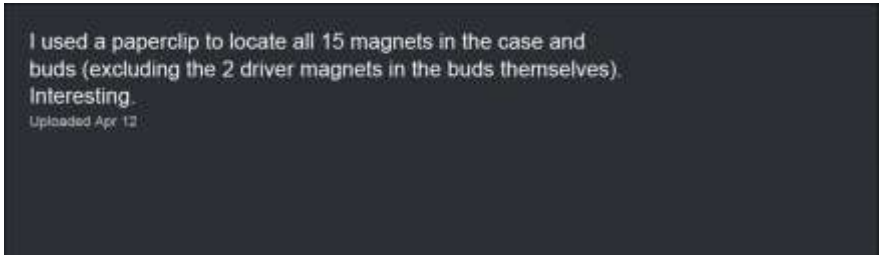
Your device contains magnets, which may affect medical devices, such as pacemakers or implantable cardioverter defibrillators. If you are using any of these medical devices, keep your device a safe distance from them and consult with your physician before you use the device. [24]

[16]

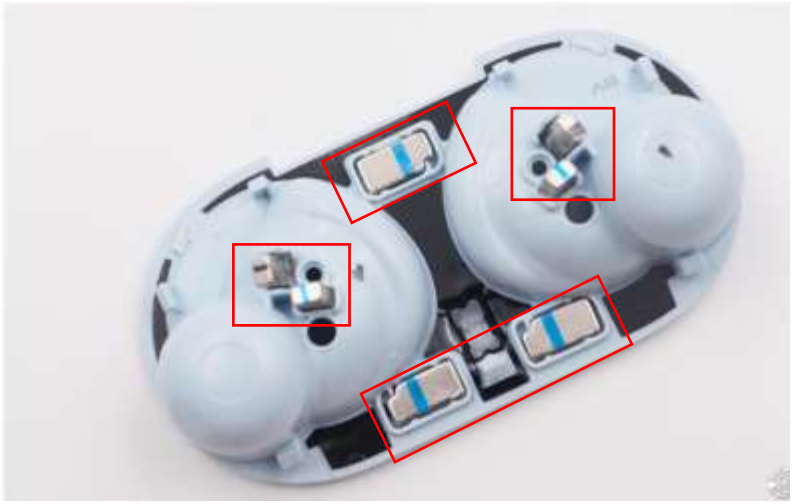

[16]

The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]


[16]

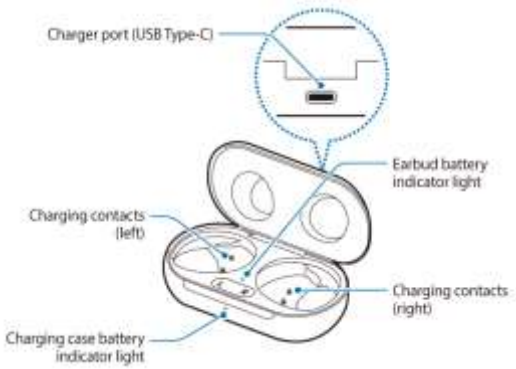
Claim 14	Evidence
14. The earphones holder of claim 10 wherein the one or more holder magnetically attractable surfaces are built into or embedded within the body.	Samsung Galaxy Buds comprise a charging case with magnetically attractable surfaces embedded within the case.  [1] Galaxy Buds: Features The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go. [2] 

[3]



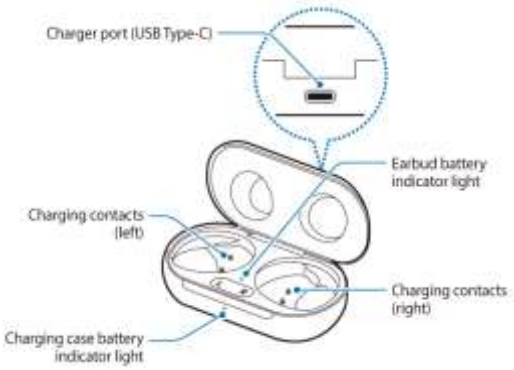
采用多颗磁铁辅助耳机定位。 [14]

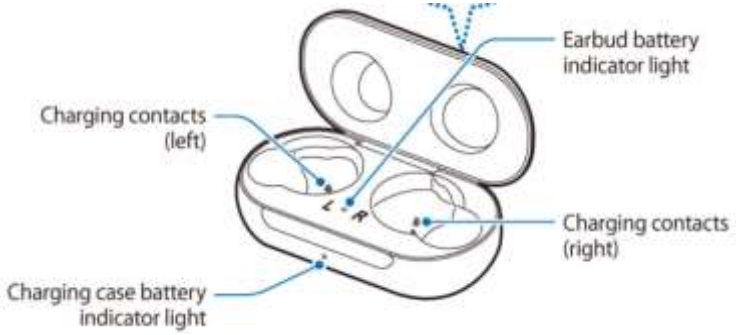
English Translation: Use multiple magnets to assist in headphone positioning

	Samsung Galaxy Buds+ comprise a charging case with magnetically attractable surfaces embedded within the case:  [24]  [23]

	 [23]

Claim 22	Evidence
22[pre]. An earphones holder comprising:	The Preamble is non-limiting. *STX LLC. v. Brine*, 211 F.3d 588, 591, 54 USPQ2d 1347, 1350 (Fed. Cir. 2000) (preamble that states a purpose or intended use for the invention is not limiting).
22[a] a holder body;	Samsung Galaxy Buds comprise a charging case: **Power up to power on.** Get up to 13 hours[1] of battery life when you are on the go with a case that doubles as a wireless charger for your wireless earbuds. One full charge provides up to six hours[1] of play time and the charging case provides up to an additional seven hours.[1] Running low on power but in a rush to get out the door? A quick 15-minute charge in the case will get you up to 1.7 hours of play time.

	 [9] Samsung Galaxy Buds+ comprise a charging case:  [24]
22[b] one or more magnetically attractable surfaces attached to the holder body,	Samsung Galaxy Buds comprise a charging case with one or more magnetically attractable surfaces:

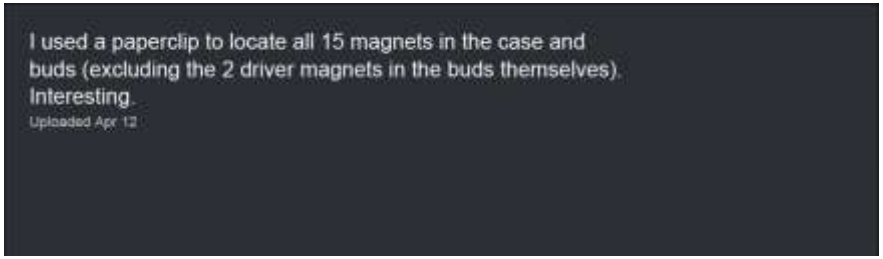


[1]

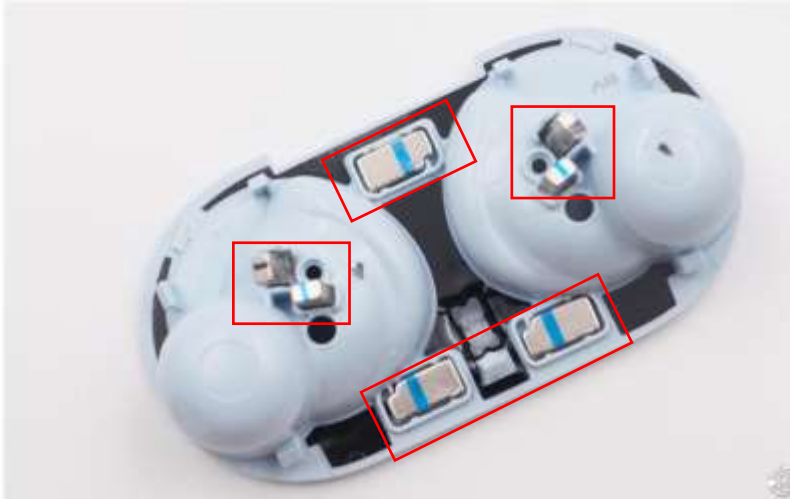
Galaxy Buds: Features

The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go.

[2]

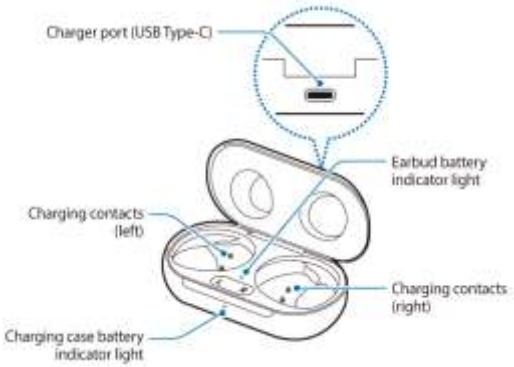


[3]



采用多颗磁铁辅助耳机定位。 [14]

English Translation: Use multiple magnets to assist in headphone positioning

	Samsung Galaxy Buds+ comprise a charging case with one or more magnetically attractable surfaces:  [24]  [23]

	 [23]
22[c] an earbud engagement detector; and	Samsung Galaxy Buds comprise an earbud engagement detector: **Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds** **Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint** SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4]

Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that:

- Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound.
- Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience.
- Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques.
- Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer.
- Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds.
- Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials.

[4]

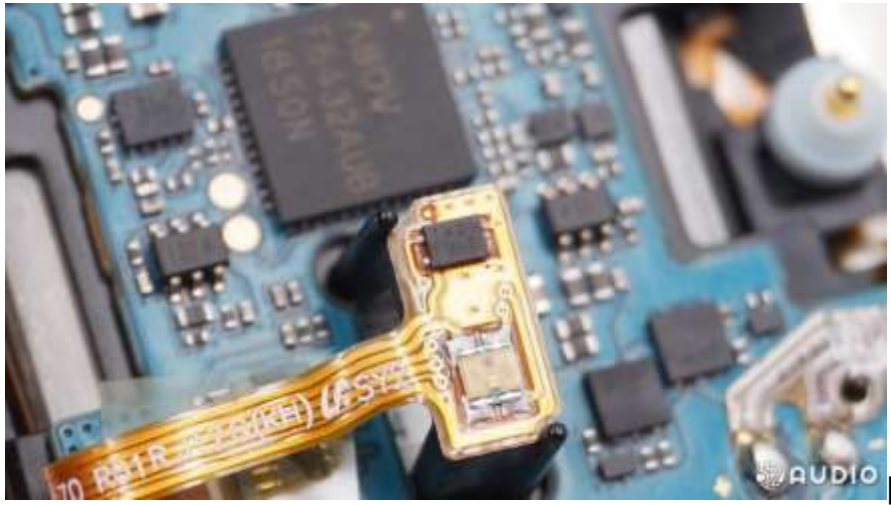
Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

[14]

On information and belief, the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip are responsive to a magnetic Hall sensor:

Samsung Galaxy Buds - The Official Samsung Galaxy Site

[5]



[14]

Broadcom BCM43014

Broadcom is an enormous identify within the wi-fi communications enterprise and has its personal vary of true wi-fi audio chips. The BCM43014 powers the Samsung Galaxy Buds, which had been introduced alongside the Samsung Galaxy S10 collection this 12 months.

The BCM43014 can also be a Bluetooth 5 chip, for what that's price, full with an audio DSP and sensor hub expertise for contact, IR, and proximity sensors. The chip helps quick scan and connection choices to enhance pairing pace. There's no ANC with the Galaxy Buds, however the BCM43014 mentions the combination of superior acoustic algorithms that cut back background noise, which might be out there to different items.

[10]

The earbud engagement detector detects if one or more magnetically attractable surfaces of the earphones are coupled/decoupled with one or more magnetically attractable surfaces attached to the holder body and accordingly signals the controller to control the Bluetooth paired device.

	 [8] Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command. [8]

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

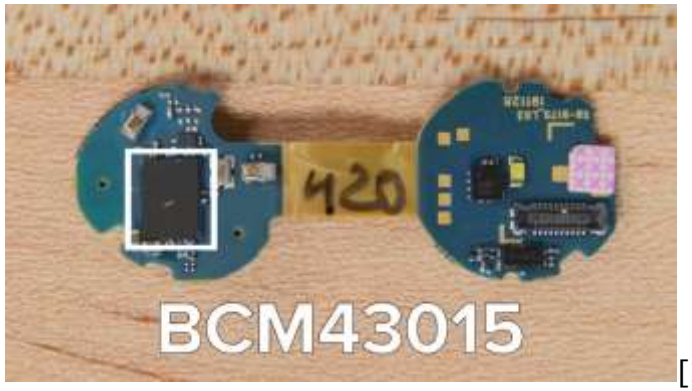
[8]

Also, Samsung Galaxy buds detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces attached to the holder body and accordingly controls the sound output in the earbuds.

The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.

[11]

Samsung Galaxy Buds+ comprise an earbud engagement detector:



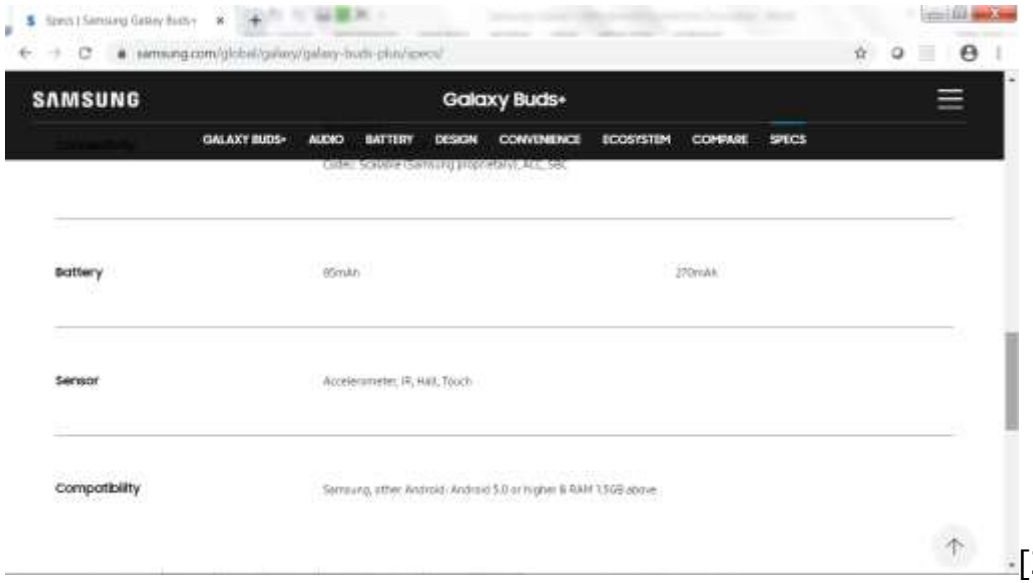
[16]

Galaxy Buds+ also include Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.

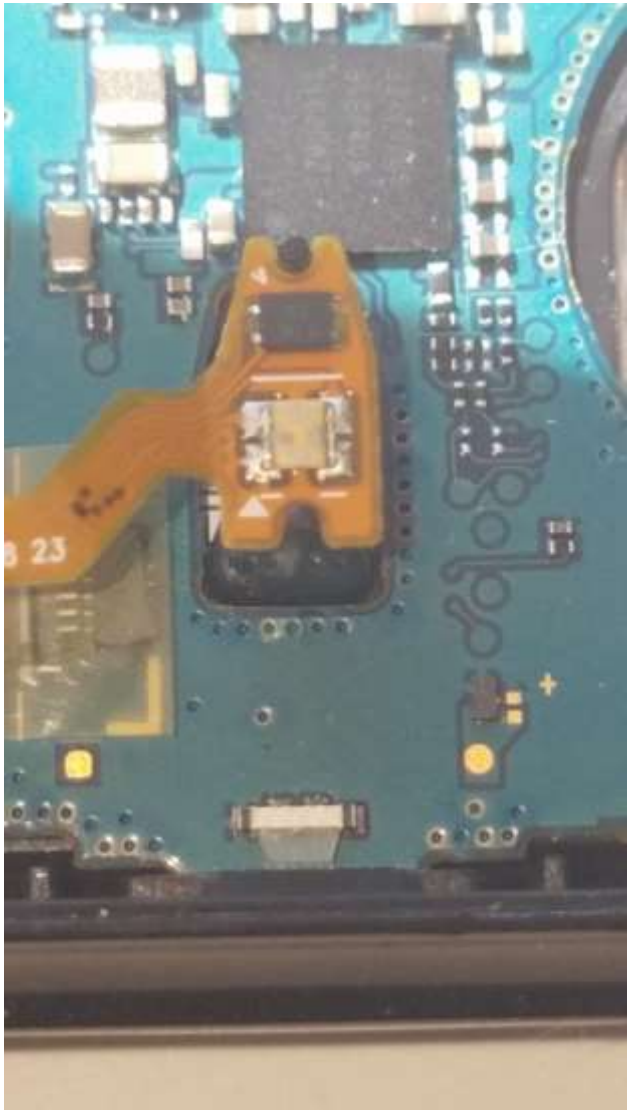
[23]

On information and belief, BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the controller and/or sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]


SAMSUNG
Galaxy Buds+
GALAXY BUDS+
AUDIO
BATTERY
DESIGN
CONVENIENCE
ECOSYSTEM
COMPARE
SPECS
Battery
Sensor
Compatibility

[22]

	 [23]

	Also, Samsung Galaxy Buds+ detect if one or more earbuds are decoupled from one or more of the magnets comprising the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnets comprising the holder body, the audio stops. The electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one or more of the magnets. When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds+ earphones are deactivated and cannot play audio when in the holder. Galaxy Buds+ are compatible with smartphones and tablets running Android 5.0 or higher, including without limitation Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, Galaxy S10e, S20, S20+ and S20 Ultra 5G. In addition, Galaxy Buds+ are compatible with iPhone7 or later models with iOS10 of higher. [10] Compatible with smartphones and tablet running Android 5.0 or higher and with more than 1.5GB of RAM. Also compatible with iPhone7 or later models with the iOS 10 or higher. [25]
22[d] an electronic device controller for controlling an electronic device coupled to the earphones, wherein a magnet of the earphones removably couples with the one or more magnetically attractable surfaces, further wherein the electronic device controller sends an activation signal to the electronic device when the earbud engagement detector detects that the magnet of the earphones has been decoupled from	Samsung Galaxy Buds comprise, an electronic device controller for controlling an electronic device (e.g. Smart Phone) coupled to the earphones:

the one or more magnetically attractable surfaces.	**Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds** **Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint** SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4] Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that: • Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound. • Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience. • Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques. • Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer. • Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds. • Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials. [4] Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

	 [14] On information and belief, the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip are responsive to a magnetic Hall sensor:


Dimensions & Weight
SAMSUNG
Ear Buds
17.5 x 22.5 x 19.2mm
5.6g
Cradle
70 x 38.8 x 26.5mm
39.6g
Performance
AP
BCM43014


Sensor
Accelerometer, Proximity, Hall, Touch

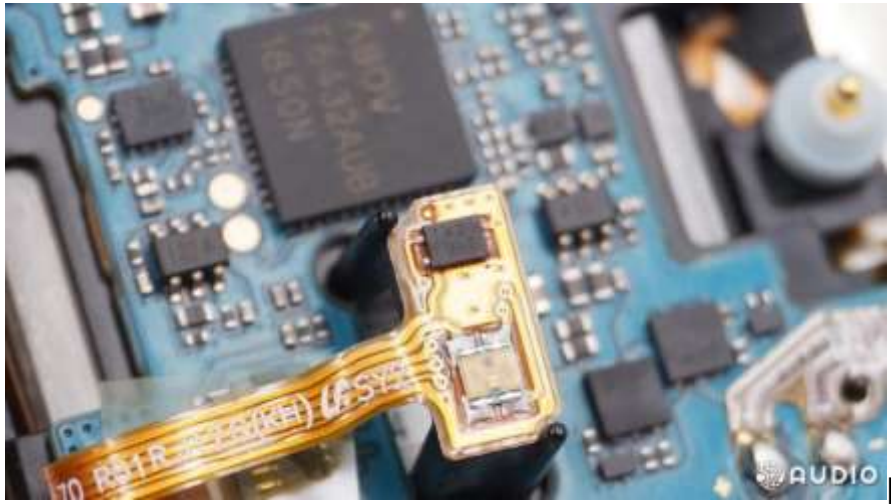
[5]

Broadcom BCM43014

Broadcom is an enormous identify within the wi-fi communications enterprise and has its personal vary of true wi-fi audio chips. The BCM43014 powers the Samsung Galaxy Buds, which had been introduced alongside the Samsung Galaxy S10 collection this 12 months.

The BCM43014 can also be a Bluetooth 5 chip, for what that's price, full with an audio DSP and sensor hub expertise for contact, IR, and proximity sensors. The chip helps quick scan and connection choices to enhance pairing pace. There's no ANC with the Galaxy Buds, however the BCM43014 mentions the combination of superior acoustic algorithms that cut back background noise, which might be out there to different items.

[10]



[14]

The smartphone is activated when the controller sends an activation signal when the engagement detector detects that one or more magnets of the earphones have been decoupled from the one or more magnetically attractable surfaces of the holder:

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

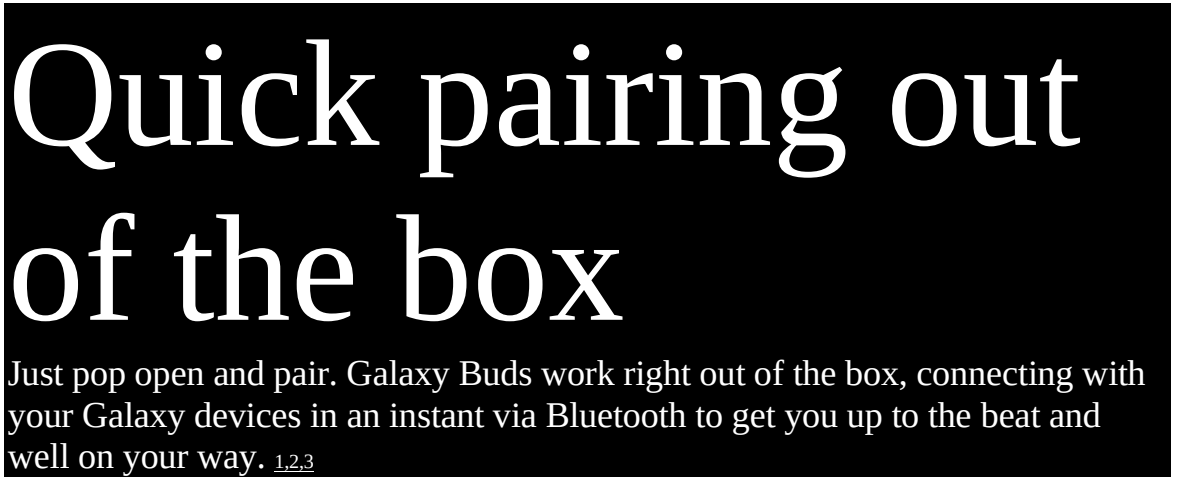
[8]

Also, Samsung Galaxy buds detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces attached to the holder body and accordingly control the sound output in the earbuds.

The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.

[11]

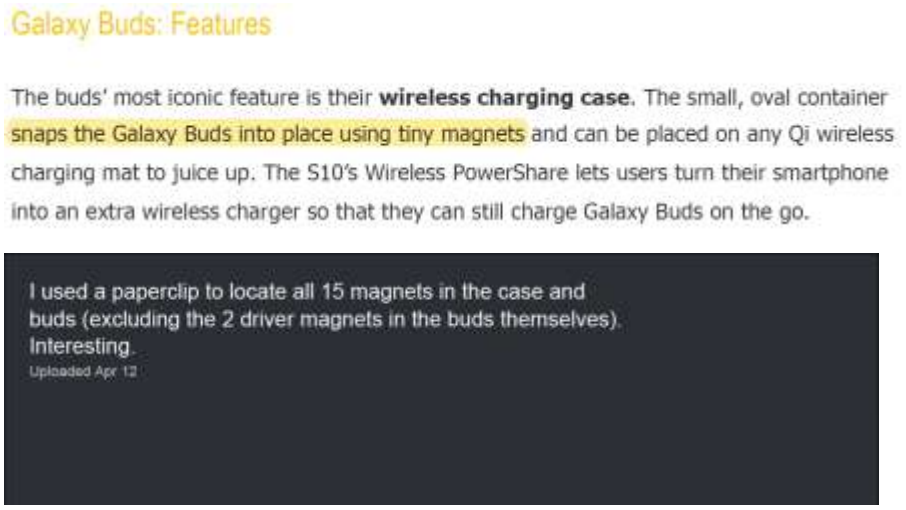
When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds earphones activate and begin playing audio when removed from the charging case.



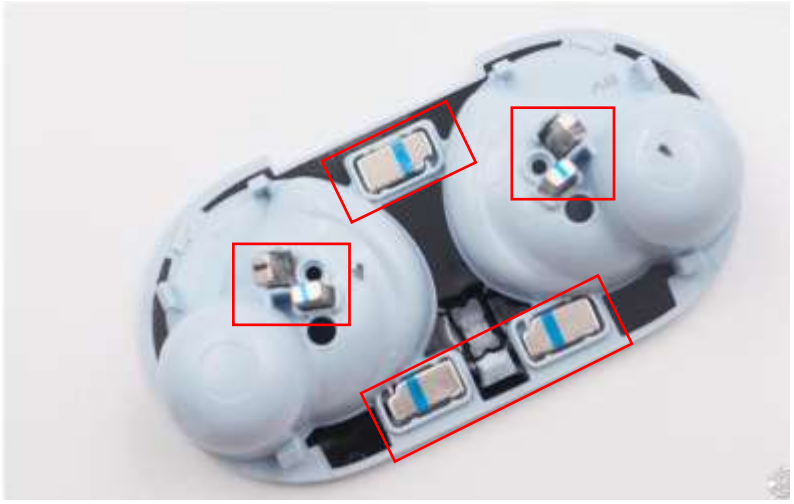
[6]

On information and belief, Galaxy Buds are compatible with Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, and Galaxy S10e.

[5]

	On information and belief, Galaxy Buds are also compatible with other smartphones, including without limitation Apple iPhones, which also include a controller for receiving Bluetooth signals.  [7] Also, the magnet of the earphones removably couples with the one or more magnetically attractable surfaces of the holder body (e.g. Wireless Charging case):  [2]

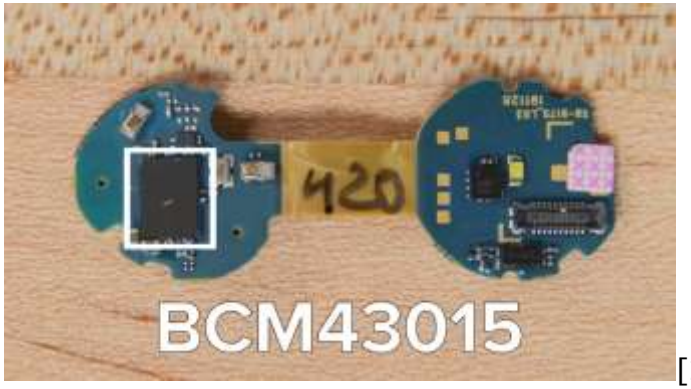
[3]



采用多颗磁铁辅助耳机定位。

[14]

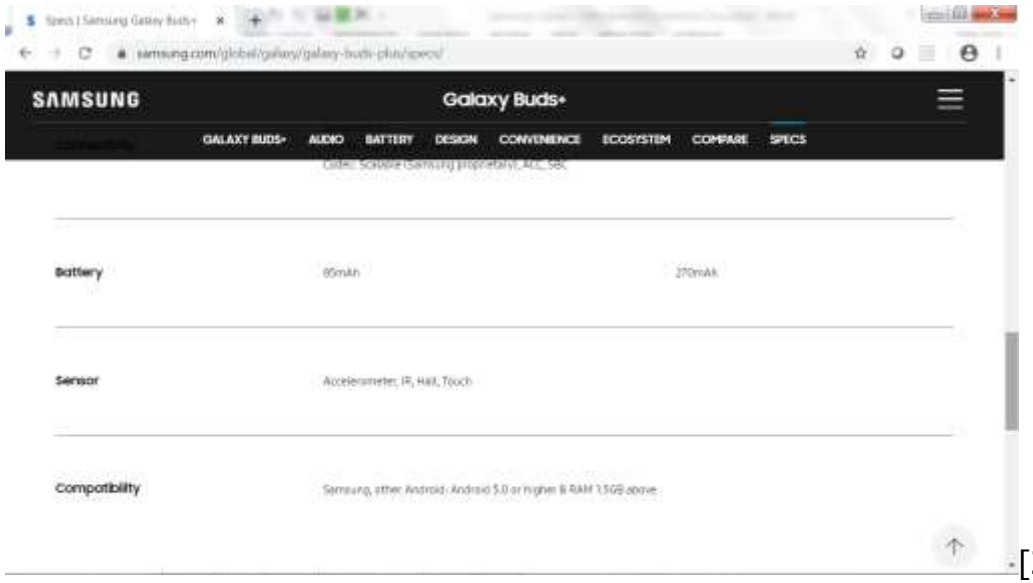
	English Translation: Use multiple magnets to assist in headphone positioning  [14] Samsung Galaxy Buds+ comprise, an electronic device controller for controlling an electronic device (e.g. Smart Phone) coupled to the earphones:

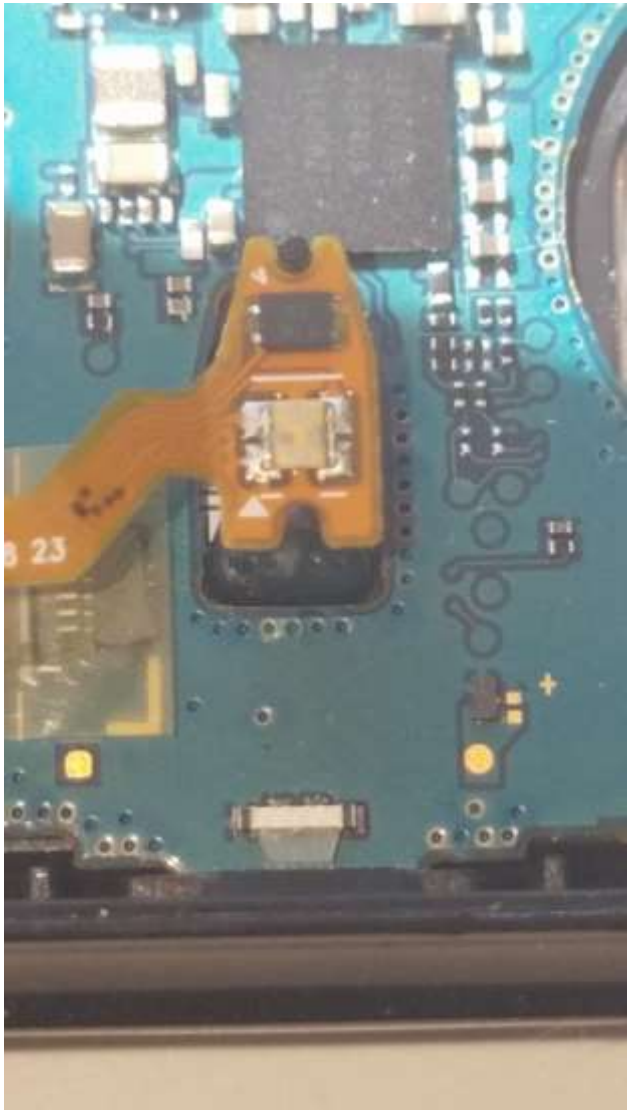
	 [16] Galaxy Buds+ also comprise Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.

[23]

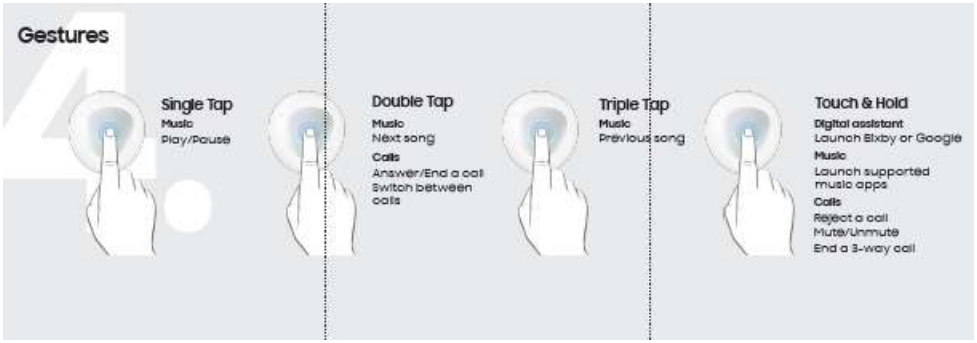
On information and belief, the BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the controller and/or sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]

	 SAMSUNG Galaxy Buds+ GALAXY BUDS+ AUDIO BATTERY DESIGN CONVENIENCE ECOSYSTEM COMPARE SPECS Battery Sensor Compatibility [22]

	 [23]

	Also, Samsung Galaxy Buds+ detect if one or more earbuds are decoupled from one or more of the magnets comprising the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnets comprising the holder body, the audio stops. The electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one or more of the magnets. When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds+ earphones are deactivated and cannot play audio when placed in the holder. Galaxy Buds+ are compatible with smartphones and tablets running Android 5.0 or higher, including without limitation Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, Galaxy S10e, S20, S20+ and S20 Ultra 5G. In addition, Galaxy Buds+ are compatible with iPhone7 or later models with iOS10 of higher. [10] Compatible with smartphones and tablet running Android 5.0 or higher and with more than 1.5GB of RAM. Also compatible with iPhone7 or later models with the iOS 10 or higher. [25] On information and belief, the BCM43015 in Galaxy Buds+ controls an electronic device coupled to the earphones:


Gestures
Single Tap
Music
Play/Pause
Double Tap
Music
Next song
Calls
Answer/End a call
Switch between calls
Triple Tap
Music
Previous song
Touch & Hold
Digital assistant
Launch Bixby or Google
Music
Launch supported music apps
Calls
Reject a call
Mute/Unmute
End a 3-way call
[21]


Using the earbuds
[26]

Claim 36	Evidence
36[pre]. A method of operating an electronic device comprising:	The Preamble is non-limiting. *STX LLC. v. Brine*, 211 F.3d 588, 591, 54 USPQ2d 1347, 1350 (Fed. Cir. 2000) (preamble that states a purpose or intended use for the invention is not limiting).
36[a] detecting an engagement status of a magnetic surface of an earbud with a magnetically attractable surface of an earphones holder;	Samsung Galaxy Buds comprise a method for detecting an engagement status of a magnetic surface of an earbud with a magnetically attractable surface of an earphone's holder: **Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds** **Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint** SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4]

Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that:

- Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound.
- Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience.
- Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques.
- Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer.
- Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds.
- Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials.

[4]

Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

[14]

On information and belief, the the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip are responsive to a magnetic Hall sensor:


Dimensions & Weight
SAMSUNG
Ear Buds
17.5 x 22.5 x 19.2mm
5.6g
Cradle
70 x 38.8 x 26.5mm
39.6g
Performance
AP
BCM43014


Samsung Galaxy Buds - The Official Samsung Galaxy Site
Sensor
Accelerometer, Proximity, Hall, Touch

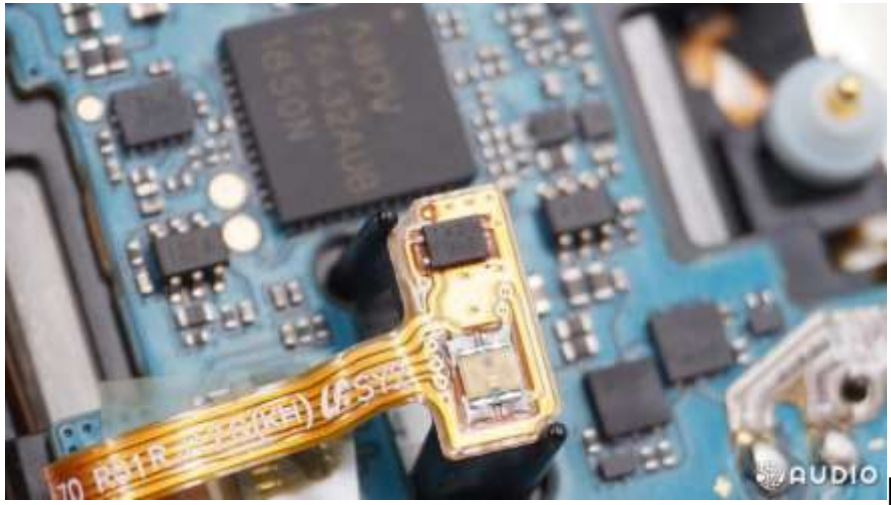
[5]

Broadcom BCM43014

Broadcom is an enormous identify within the wi-fi communications enterprise and has its personal vary of true wi-fi audio chips. The BCM43014 powers the Samsung Galaxy Buds, which had been introduced alongside the Samsung Galaxy S10 collection this 12 months.

The BCM43014 can also be a Bluetooth 5 chip, for what that's price, full with an audio DSP and sensor hub expertise for contact, IR, and proximity sensors. The chip helps quick scan and connection choices to enhance pairing pace. There's no ANC with the Galaxy Buds, however the BCM43014 mentions the combination of superior acoustic algorithms that cut back background noise, which might be out there to different items.

[10]



[14]

The earbud engagement detector detects if one or more magnetically attractable surfaces of the earphones are coupled/decoupled with one or more magnetically attractable surfaces attached to the holder body and accordingly signals the controller to control the Bluetooth paired device.

	 [8] Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command. [8]

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

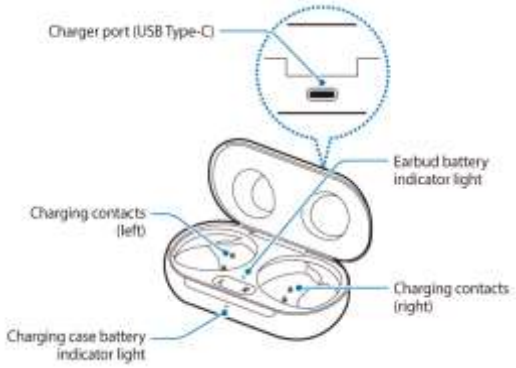
[8]

Also, Samsung Galaxy buds detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces attached to the holder body and accordingly controls the sound output in the earbuds.

The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.

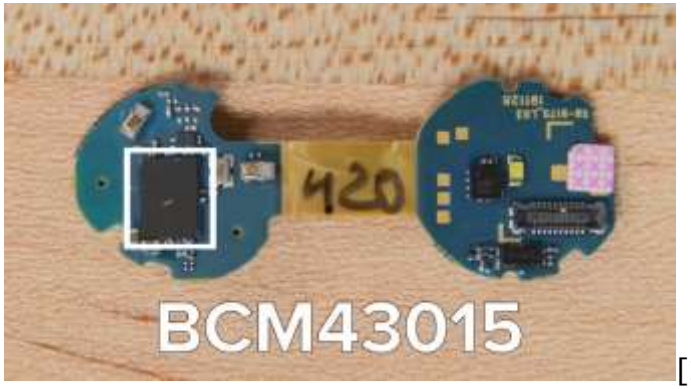
[11]

Samsung Galaxy Buds+ comprise a method for detecting an engagement status of a magnetic surface of an earbud with a magnetically attractable surface of an earphones holder:



[24]

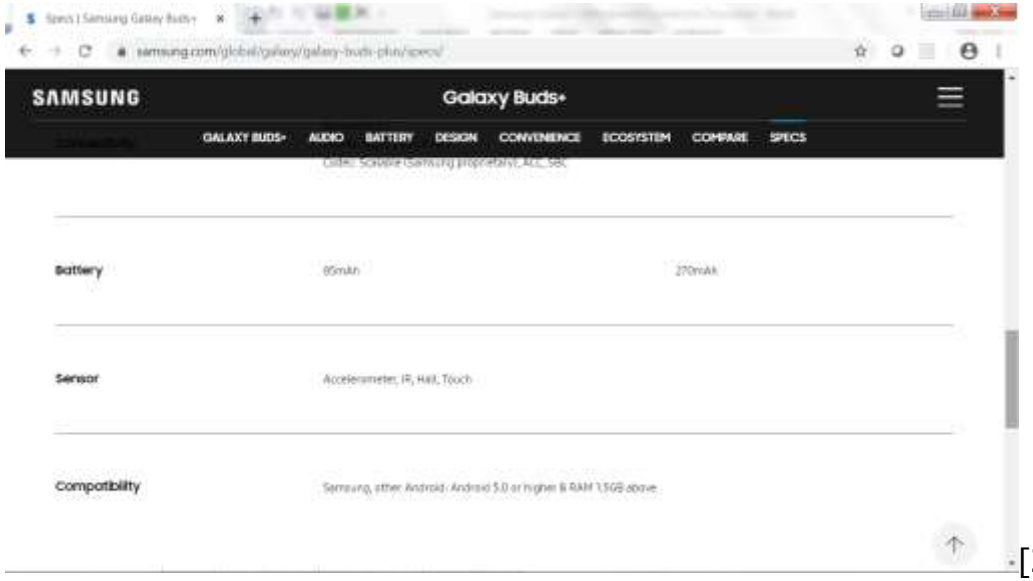
	 [23]  [23]

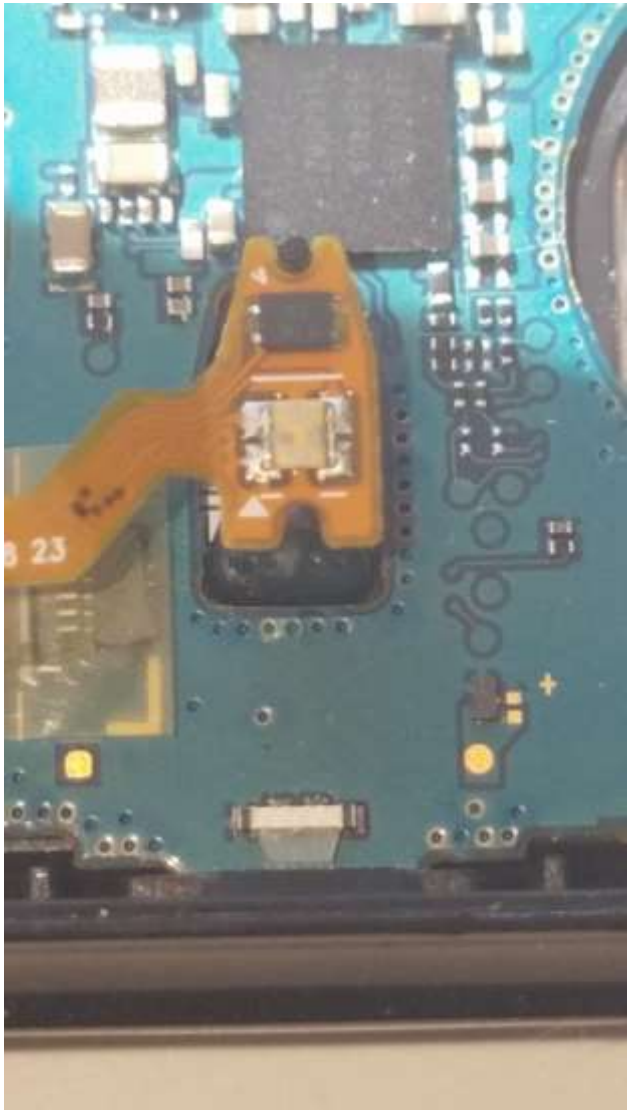
	 [16] Galaxy Buds+ also comprise Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.

[23]

On information and belief, BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the controller and/or sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]

	 SAMSUNG Galaxy Buds+ GALAXY BUDS+ AUDIO BATTERY DESIGN CONVENIENCE ECOSYSTEM COMPARE SPECS Battery Sensor Accelerometer, IR, Hall, Touch Compatibility [22]

	 [23]

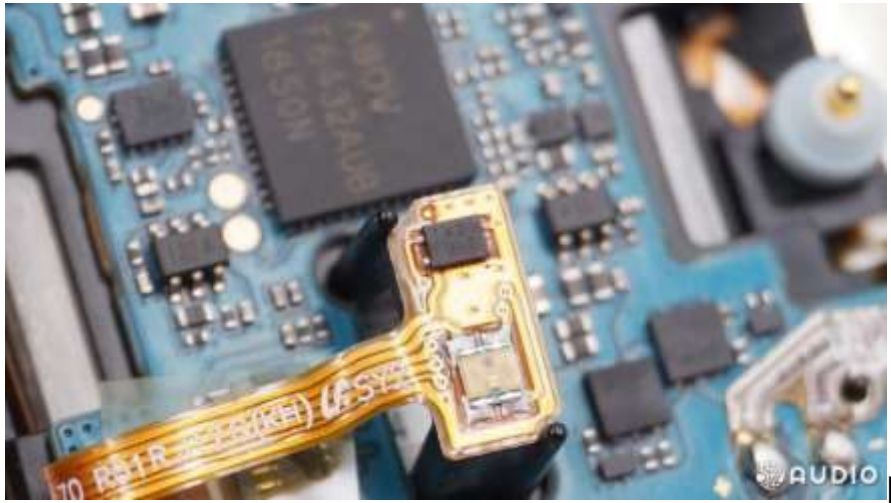
	Also, Samsung Galaxy Buds+ detect if one or more earbud magnetic surfaces are engaged with magnetically attractable surface of an earphones holder and sends an activation signal when an earphone is decoupled from one or more of the magnetically attractable surfaces of the earphones holder and accordingly controls the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnets comprising the holder body, audio stops. The electronic device controller receives a deactivation signal when one or more of the set of earphones magnetic surfaces are coupled to one or more of the magnetically attractable surfaces of the holder. When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds+ earphones are deactivated and cannot play audio when in the holder. Galaxy Buds+ are compatible with smartphones and tablets running Android 5.0 or higher, including without limitation Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, Galaxy S10e, S20, S20+ and S20 Ultra 5G. In addition, Galaxy Buds+ are compatible with iPhone7 or later models with iOS10 of higher. [10] Compatible with smartphones and tablet running Android 5.0 or higher and with more than 1.5GB of RAM. Also compatible with iPhone7 or later models with the iOS 10 or higher. [25] Samsung Galaxy Buds+ operate an electronic device (e.g. Smart Phone) based upon the engagement status of the earbud.

36[b] sending an activation signal to an electronic device when the magnetic surface of the earbud is decoupled with the magnetically attractable surface of the earphones holder;	Samsung Galaxy Buds comprise an electronic device controller sending an activation signal to an electronic device (e.g. Smart Phone) when the magnetic surface of the earbud is decoupled with the magnetically attractable surface of the earphones holder: **Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds** **Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint** SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4] Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that: • Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound. • Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience. • Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques. • Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer. • Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds. • Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials. [4] Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

	 [14] On information and belief, the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip are responsive to a magnetic Hall sensor:

Samsung Galaxy Buds - The Official Samsung Galaxy Site

[5]

	 [14] When one or more magnetic surface of the earbud is decoupled with the one or more magnetically attractable surface of the earphone's holder, the controller sends a signal to activate the smartphone:

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

[8]

Also, Samsung Galaxy Buds detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces attached to the holder body and accordingly control the sound output in the earbuds.

The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.

[11]

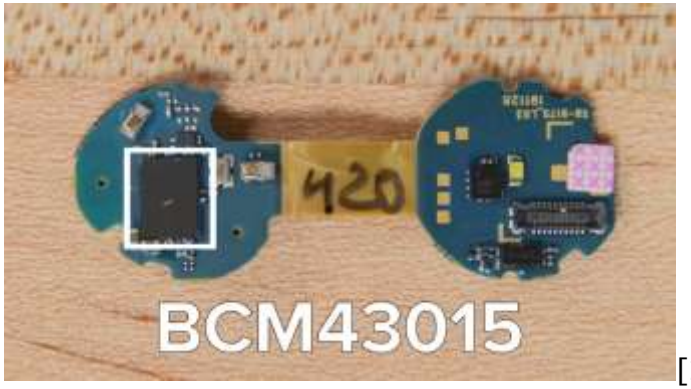
When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds earphones activate and begin playing audio when removed from the charging case.

Quick pairing out of the box

Just pop open and pair. Galaxy Buds work right out of the box, connecting with your Galaxy devices in an instant via Bluetooth to get you up to the beat and well on your way. 1,2,3

[6]

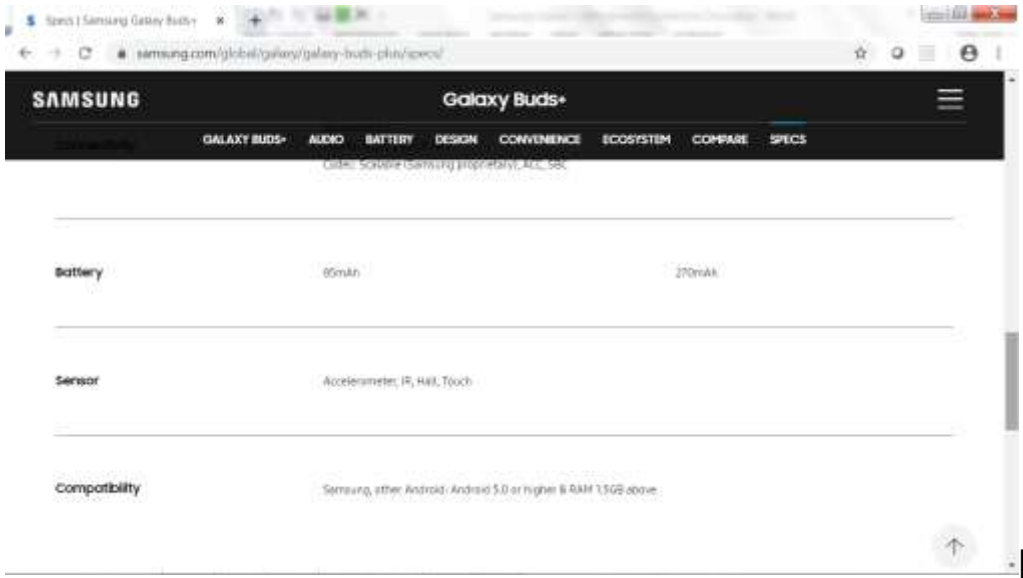
Samsung Galaxy Buds+ comprise an electronic device controller sending an activation signal to an electronic device (e.g. Smart Phone) when the magnetic surface of the earbud is decoupled with the magnetically attractable surface of the earphones holder:

	 [16] Galaxy Buds+ also comprise Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.

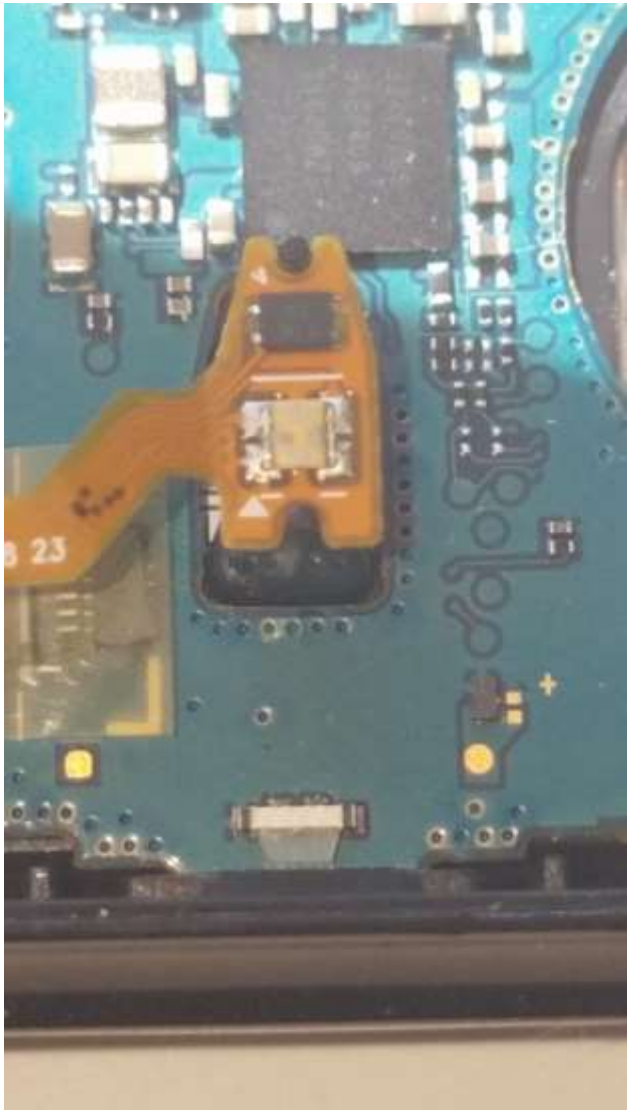
[23]

On information and belief, BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the controller and/or sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]


SAMSUNG
Galaxy Buds+
GALAXY BUDS+
AUDIO
BATTERY
DESIGN
CONVENIENCE
ECOSYSTEM
COMPARE
SPECS
Battery
Sensor
Compatibility

[22]

	 [23]

	Samsung Galaxy Buds+ detect if one or more magnetic surfaces of earbuds are decoupled from a magnetically attractable surface of the earphones holder and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnets comprising the holder body, audio stops. The electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one or more of the magnets. When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds+ earphones are deactivated and cannot play audio when in the holder. Galaxy Buds+ are compatible with smartphones and tablets running Android 5.0 or higher, including without limitation Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, Galaxy S10e, S20, S20+ and S20 Ultra 5G. In addition, Galaxy Buds+ are compatible with iPhone7 or later models with iOS10 of higher. [10] Compatible with smartphones and tablet running Android 5.0 or higher and with more than 1.5GB of RAM. Also compatible with iPhone7 or later models with the iOS 10 or higher. [25]
36[c] sending a deactivation signal to the electronic device when the magnetic surface of the earbud is coupled to the magnetically attractable surface of the earphones holder; and	Samsung Galaxy Buds comprise an electronic device controller sending a deactivation signal to an electronic device when the magnetic surface of the earbud is coupled to the magnetically attractable surface of the earphones holder:

Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds

Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint

SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4]

Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that:

- Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound.
- Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience.
- Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques.
- Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer.
- Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds.
- Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials. [4]

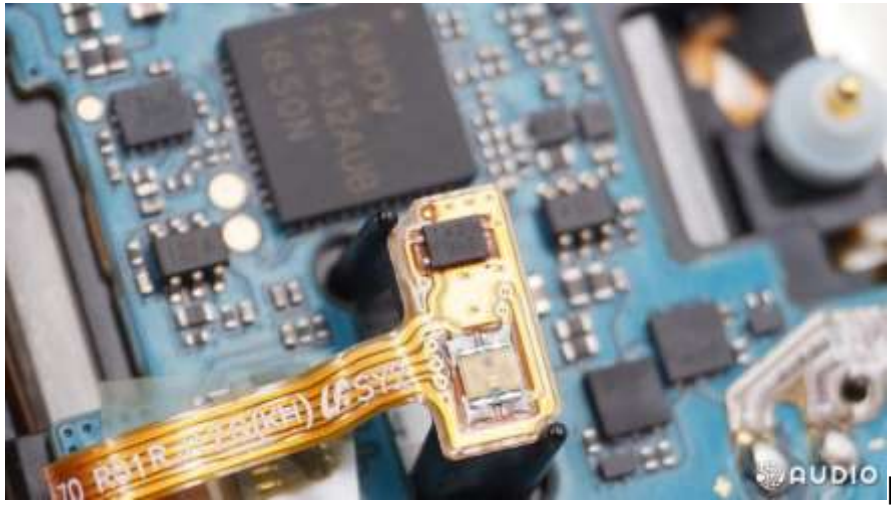
Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

	 [14] On information and belief, the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip are responsive to a magnetic Hall sensor:


Dimensions & Weight
SAMSUNG
Ear Buds
17.5 x 22.5 x 19.2mm
5.6g
Cradle
70 x 38.8 x 26.5mm
39.6g
Performance
AP
BCM43014


Samsung Galaxy Buds - The Official Samsung Galaxy Site
Sensor
Accelerometer, Proximity, Hall, Touch

[5]

	 [14] When one or more magnetic surface of the earbud is coupled to the one or more magnetically attractable surface of the earphones holder, the controller sends a signal to deactivate the smartphone:

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

[8]

Also, Samsung Galaxy buds detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces attached to the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnetically attractable surfaces attached to the holder body, audio stops.

	The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.  [11]

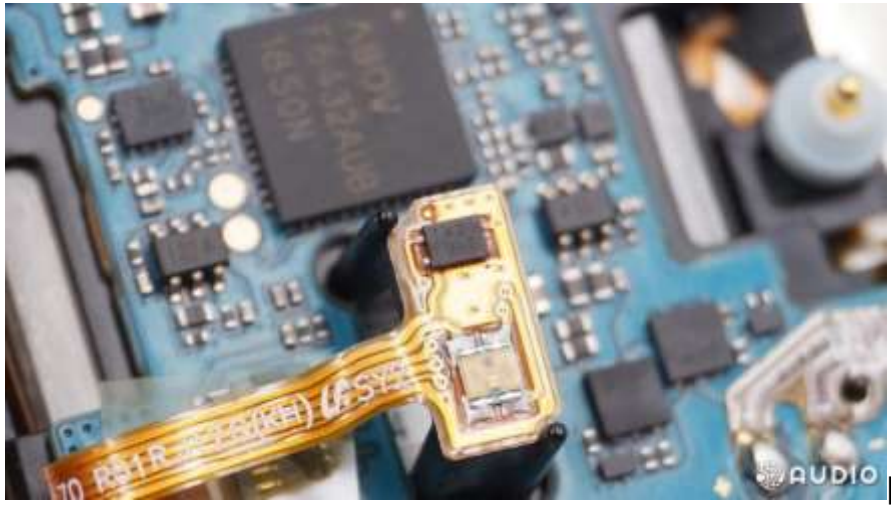
36[d] operating the electronic device based upon the engagement status of the earbud.	Samsung Galaxy buds can operate an electronic device (e.g. Smart Phone) based upon the engagement status of the earbud: **Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds** **Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint** SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4] Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that: • Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound. • Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience. • Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques. • Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer. • Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds. • Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials. [4] Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

	 [14] On information and belief, the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip are responsive to a magnetic Hall sensor:


Dimensions & Weight
SAMSUNG
Ear Buds
17.5 x 22.5 x 19.2mm
5.6g
Cradle
70 x 38.8 x 26.5mm
39.6g
Performance
AP
BCM43014


Sensor
Accelerometer, Proximity, Hall, Touch

[5]

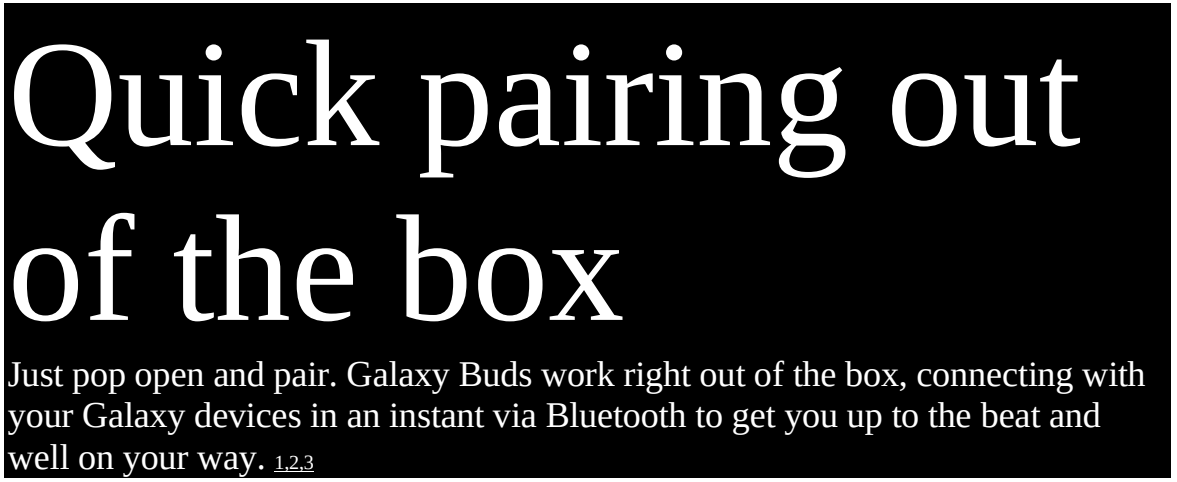
	 [14] When one or more magnetic surface of the earbud is decoupled with the one or more magnetically attractable surface of the earphones holder, the controller sends a signal to activate the smartphone:

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

[8]

When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds earphones activate and begin playing audio when removed from the charging case.

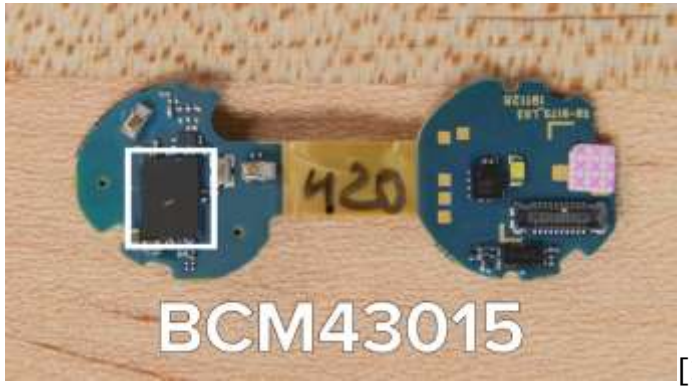
	 [6] When one or more magnetic surfaces of the earbud is coupled to the one or more magnetically attractable surfaces of the earphones holder, the controller sends a signal to deactivate the smartphone:

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

[8]

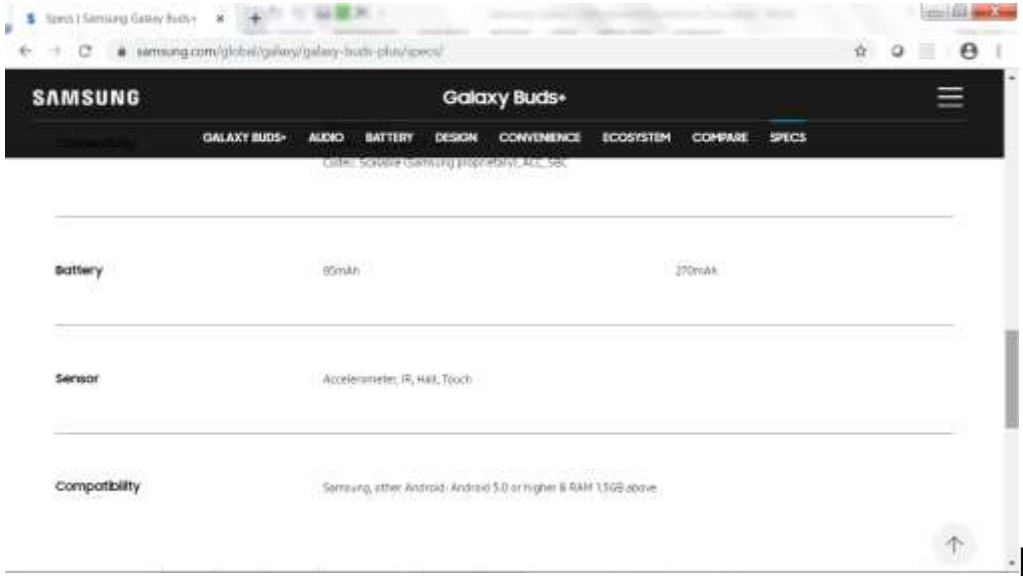
Samsung Galaxy Buds+ operate an electronic device (e.g. Smart Phone) based upon the engagement status of the earbud:

	 [16] Galaxy Buds+ also include Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.

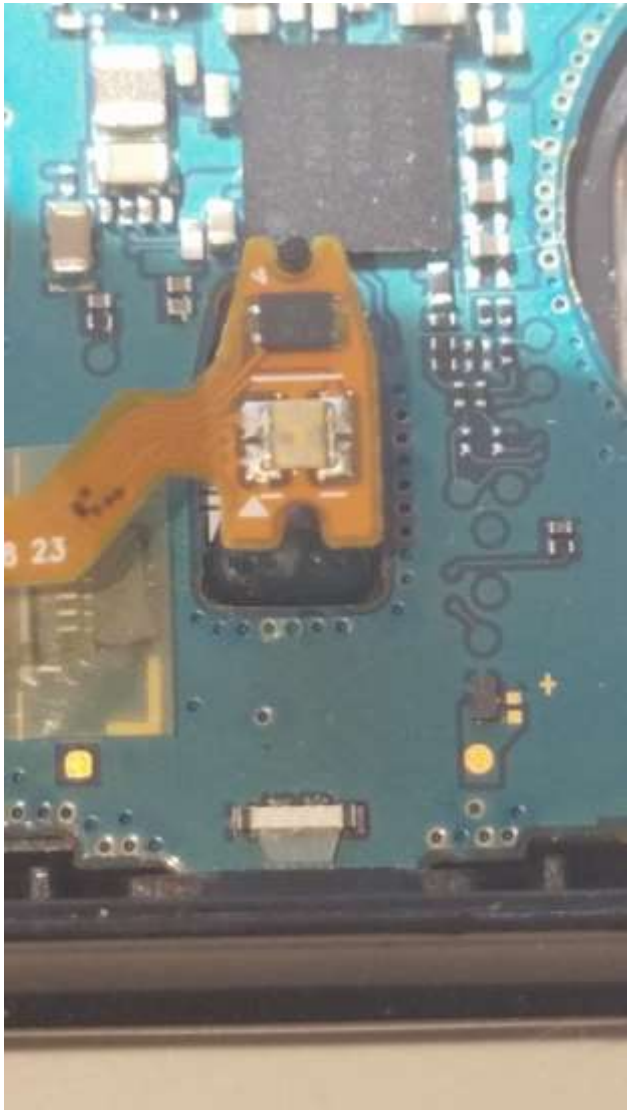
[23]

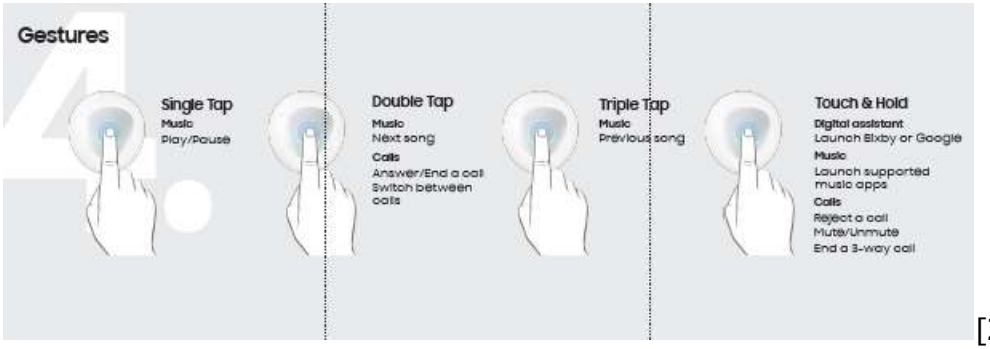
On information and belief, BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the controller and/or sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]


SAMSUNG
Galaxy Buds+
GALAXY BUDS+
AUDIO
BATTERY
DESIGN
CONVENIENCE
ECOSYSTEM
COMPARE
SPECS
Battery
Sensor
Compatibility

[22]

	 [23]

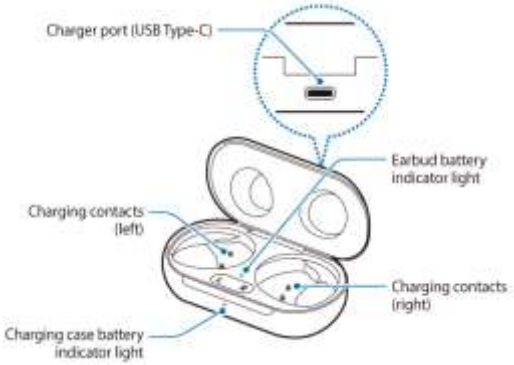

Gestures
Single Tap
Music
Play/Pause
Double Tap
Music
Next song
Calls
Answer/End a call
Switch between calls
Triple Tap
Music
Previous song
Touch & Hold
Digital assistant
Launch Bixby or Google
Music
Launch supported music apps
Calls
Reject a call
Mute/Unmute
End a 3-way call

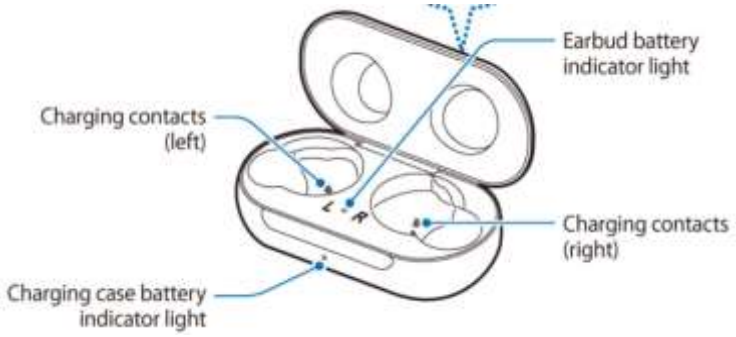
[21]

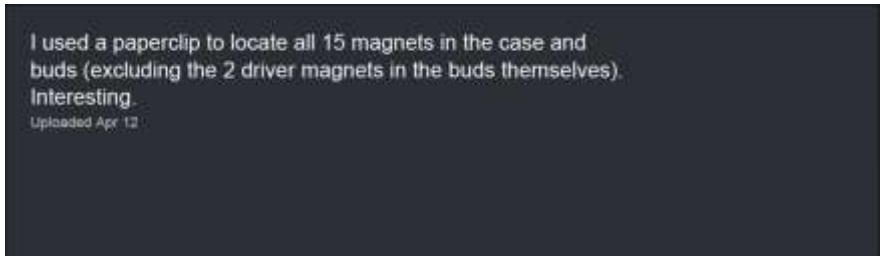

Using the earbuds

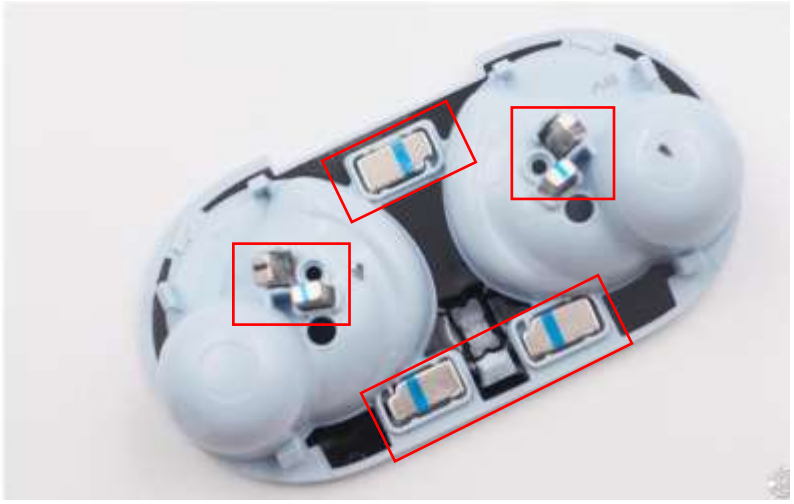
[26]

Claim 37	Evidence
37[pre]. A system for holding a set of earphones comprising:	The Preamble is non-limiting. *STX LLC. v. Brine*, 211 F.3d 588, 591, 54 USPQ2d 1347, 1350 (Fed. Cir. 2000) (preamble that states a purpose or intended use for the invention is not limiting).
37[a] a holder body;	Samsung Galaxy Buds comprise a charging case:  [9]

	Samsung Galaxy Buds+ comprise a charging case:  [24]

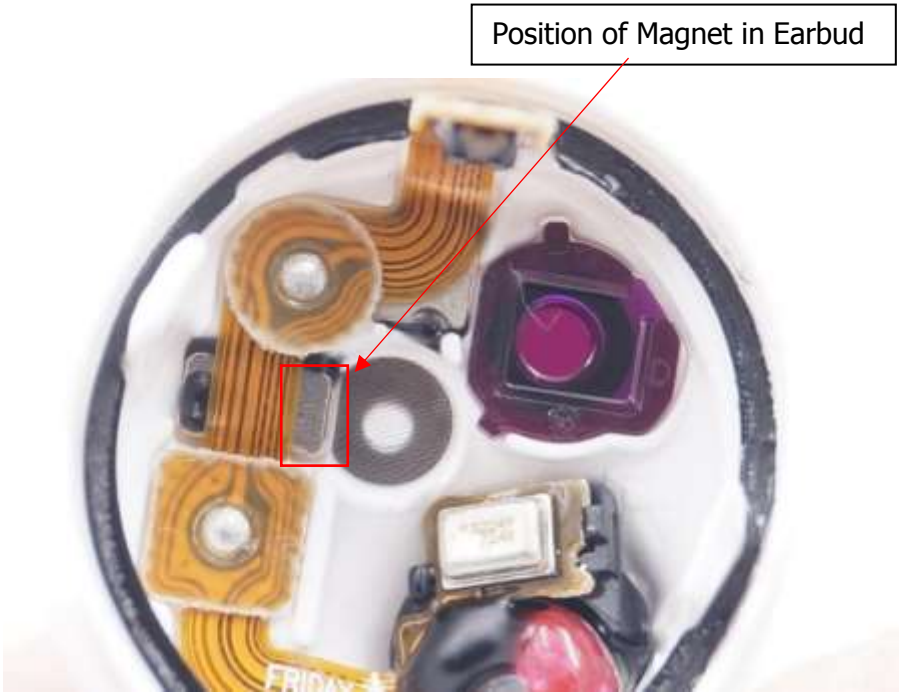
37[b] one or more magnetically attractable surfaces attached to the holder body for removably coupling with a magnetic surface of a set of earphones;	Samsung Galaxy Buds comprise a charging case with one or more magnetically attractable surfaces for removably coupling with a magnetic surface of a set of earphones:  [1]

	Galaxy Buds: Features The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go. [2] 

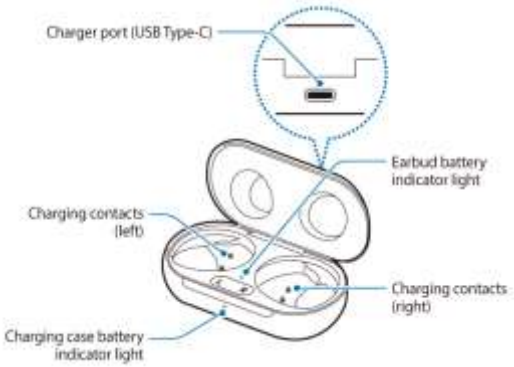
	 [3]
	

采用多颗磁铁辅助耳机定位。 [14]

English Translation: Use multiple magnets to assist in headphone positioning



[14]

	Samsung Galaxy Buds+ comprise a charging case with one or more magnetically attractable surfaces for removably coupling with a magnetic surface of a set of earphones:  [24]  [23]

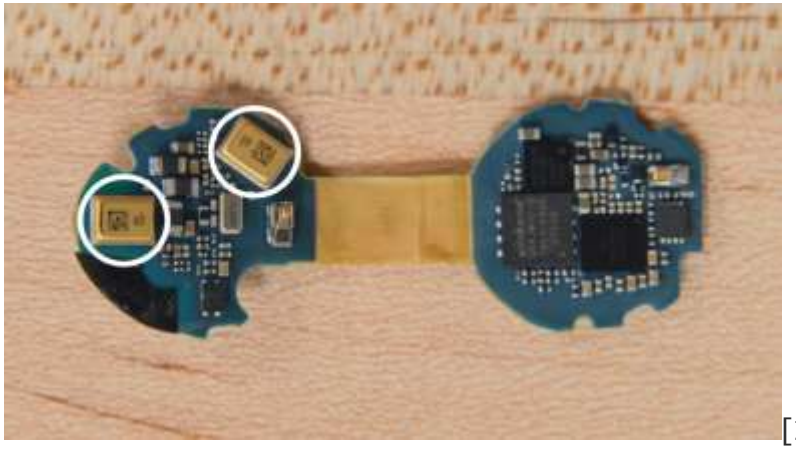
[23]

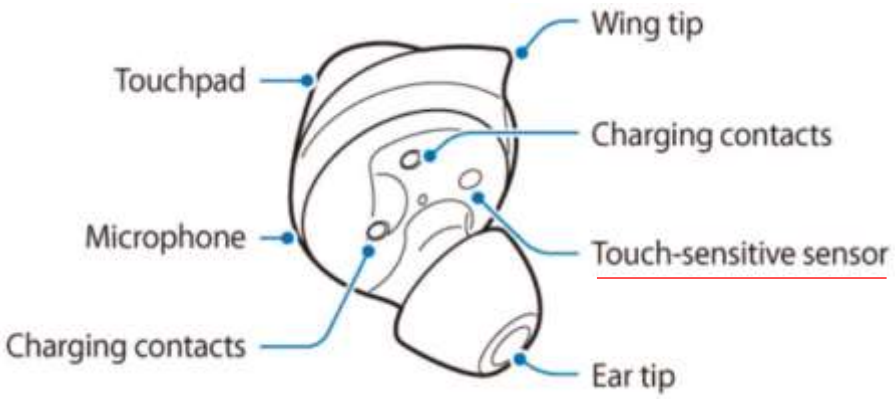
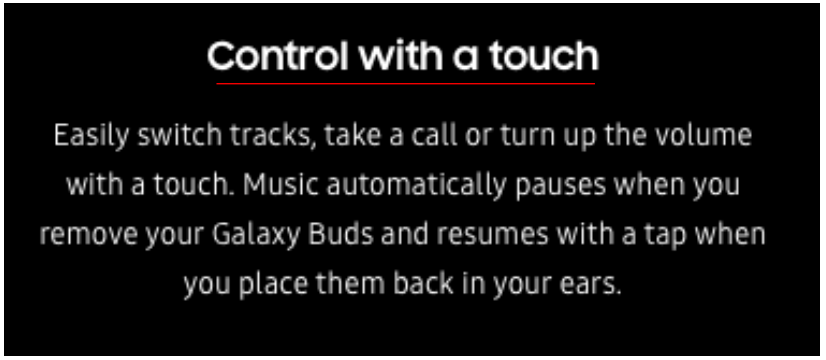
Your device contains magnets, which may affect medical devices, such as pacemakers or implantable cardioverter defibrillators. If you are using any of these medical devices, keep your device a safe distance from them and consult with your physician before you use the device. [24]

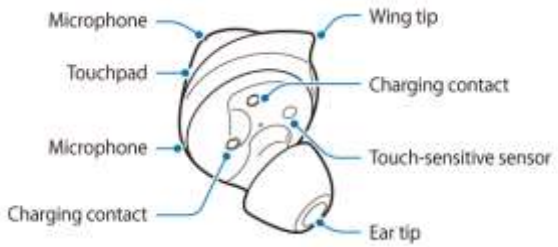
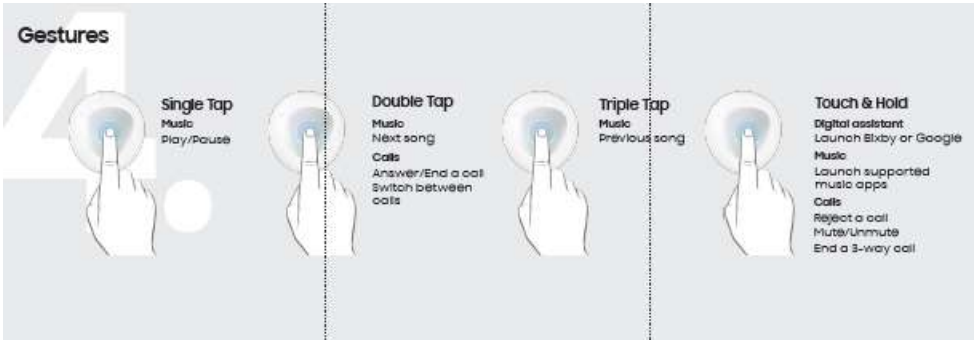
[16]


[16]

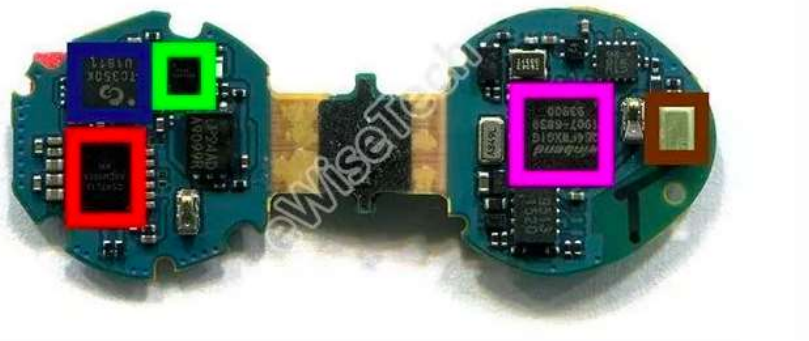
The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]


[16]

37[c] a touch sensor;	Samsung Galaxy Buds comprise a touch sensor to control music and answer/end phone calls:  [1]  [5]  [9]

	Samsung Galaxy Buds+ comprise a touch sensor to control music and answer/end phone calls:  [24]  [21]

	 [26]
37[d] a touch sensor detector; and	Samsung Galaxy Buds comprise a touch sensor detector to sense the various gestures performed on earbud's touchpad:  [5]



Blue: CORERIVER-TC350K-CapacitiveTouch Sensor Controller [15]

Touchpad commands for Galaxy Buds

Earbud touchpad commands

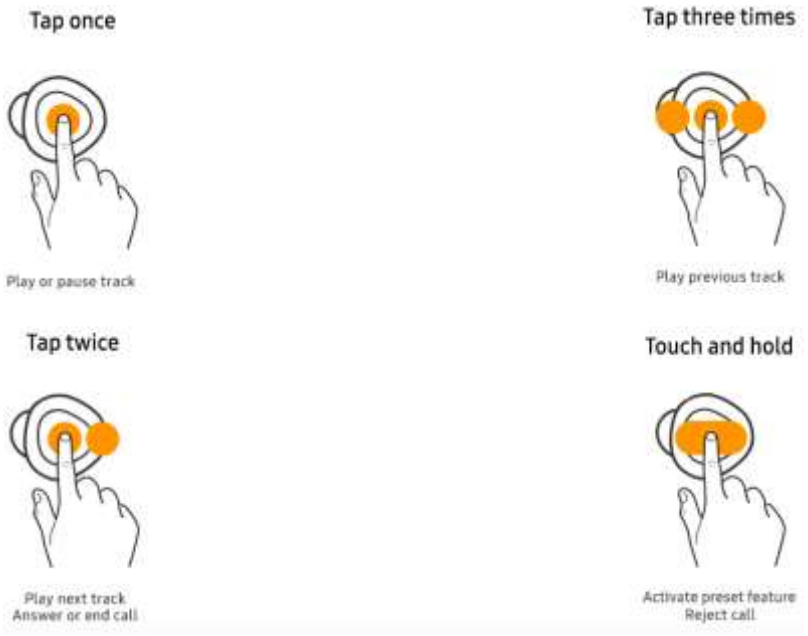
All the controls you need are at your fingertips with the touchpads on your earbuds.

- Tap the touchpad to play or pause music.
- To skip songs or answer/end phone calls, quickly tap the touchpad two times. If you want to answer a second call or switch between calls, quickly tap the touchpad two times.
- To play the previous song during music playback, quickly tap the touchpad three times. If your triple tap the touchpad three seconds after the track starts to play, the current track will restart instead.
- To reject a call, touch and hold the touchpad for more than two seconds.
- When you want to end the current call and retrieve a call placed on hold, touch and hold the touchpad for more than two seconds.

[12]

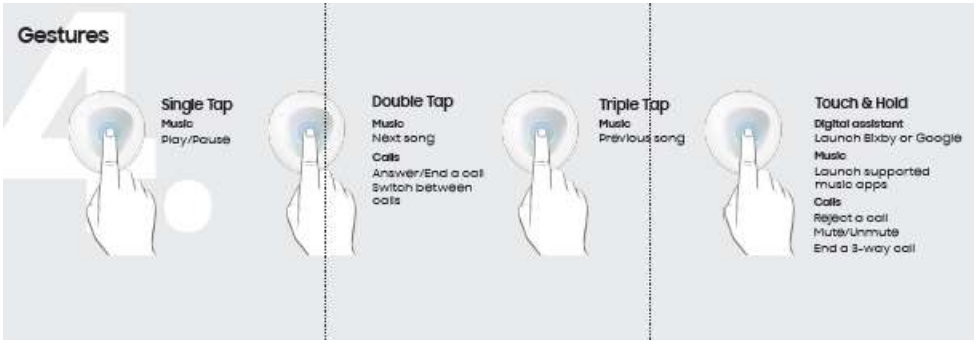
Galaxy Buds touch gestures

Check out this handy visual guide that breaks down all the touch gestures for Galaxy Buds. Depending on the circumstances, these gestures may perform a different task.



[12]

Samsung Galaxy Buds+ comprise a touch sensor detector to sense the various gestures performed on earbud's touchpad:



[21]

	 [26] On information and belief, Samsung Galaxy Buds+ include a controller for the touch sensor.
37[e] an electronic device controller for controlling an electronic device by sending an activation signal when the magnetic surface of the set of earphones is decoupled from the one or more magnetically attractable surfaces, wherein the system wirelessly communicates with the electronic device.	Samsung Galaxy Buds comprise, an electronic device controller for controlling an electronic device (e.g. Smart Phone) by sending an activation signal when the magnetic surface of the set of earphones is decoupled from the one or more magnetically attractable surfaces, wherein the system wirelessly communicates with the electronic device: **Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds** **Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint** SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4]

Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that:

- Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound.
- Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience.
- Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques.
- Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer.
- Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds.
- Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials.

[4]

Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

[14]

On information and belief, the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip are responsive to a magnetic Hall sensor:

Samsung Galaxy Buds - The Official Samsung Galaxy Site

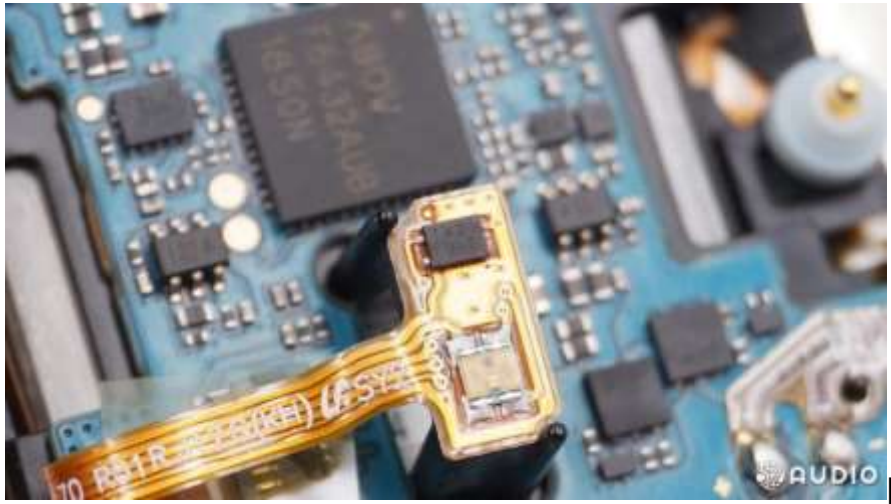
[5]

Broadcom BCM43014

Broadcom is an enormous identify within the wi-fi communications enterprise and has its personal vary of true wi-fi audio chips. The BCM43014 powers the Samsung Galaxy Buds, which had been introduced alongside the Samsung Galaxy S10 collection this 12 months.

The BCM43014 can also be a Bluetooth 5 chip, for what that's price, full with an audio DSP and sensor hub expertise for contact, IR, and proximity sensors. The chip helps quick scan and connection choices to enhance pairing pace. There's no ANC with the Galaxy Buds, however the BCM43014 mentions the combination of superior acoustic algorithms that cut back background noise, which might be out there to different items.

[10]



[14]

The smartphone is activated when the magnetic surface of the set of earphones is decoupled from the one or more magnetically attractable surfaces of the holder:

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

[8]

Also, Samsung Galaxy buds detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces attached to the holder body and accordingly control the sound output in the earbuds.

The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.

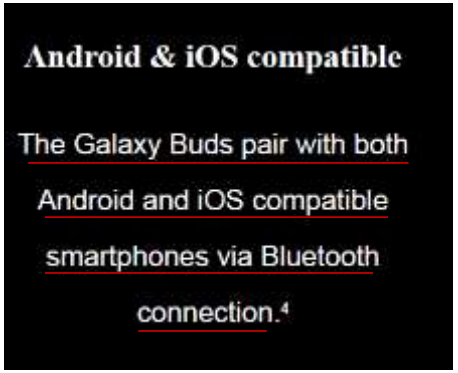
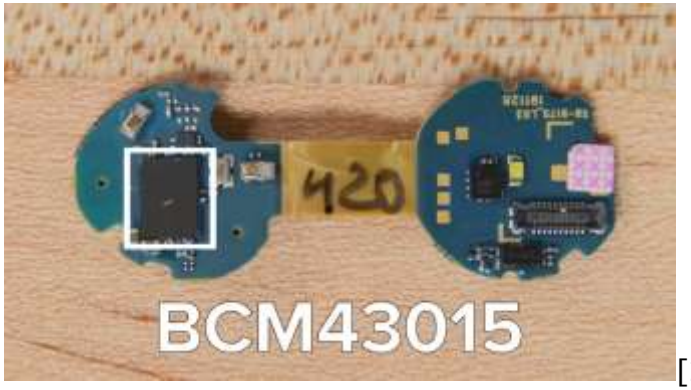
[11]

When wirelessly paired to a Bluetooth device that is playing audio, one or both Galaxy Buds earphones activate and begin playing audio when removed from the charging case.

[6]

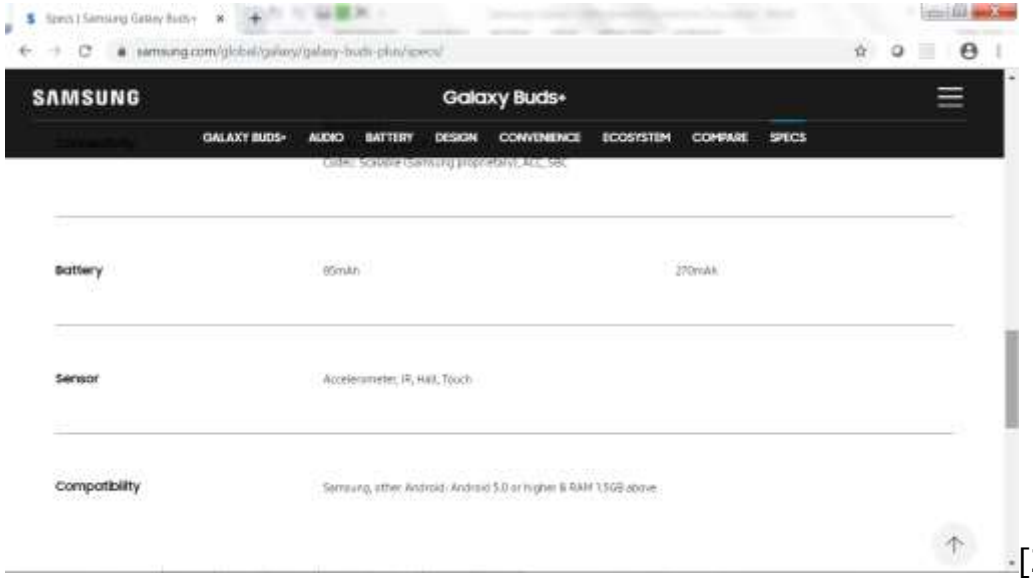
On information and belief, Galaxy Buds are compatible with Samsung Galaxy products, all of which include a controller configured to wirelessly send and receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, and Galaxy S10e.

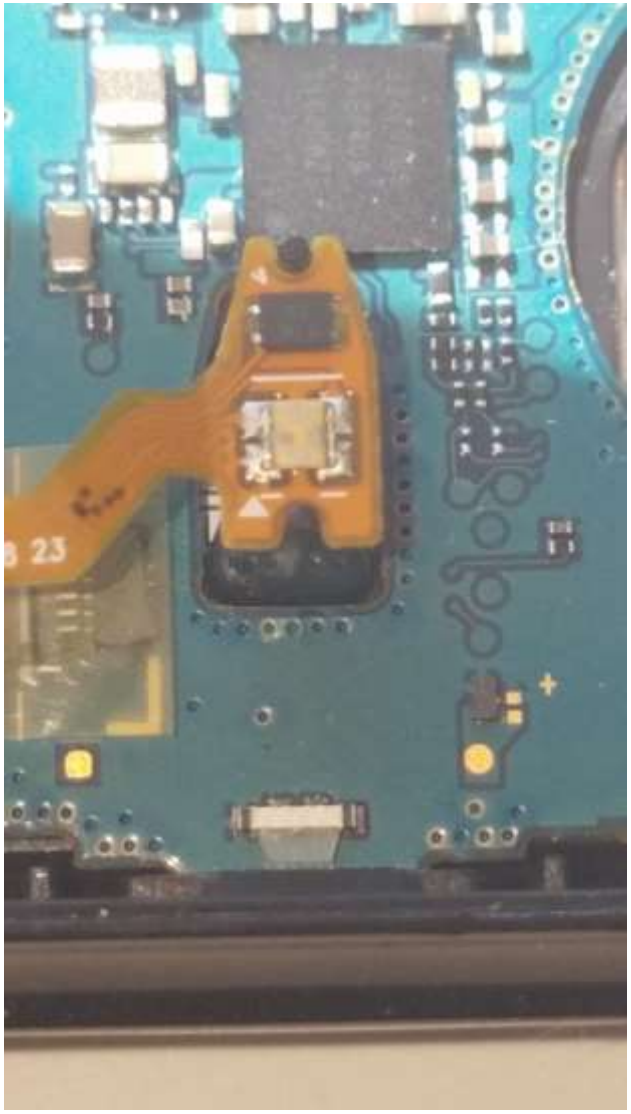
[5]

	On information and belief, Galaxy Buds are also compatible with other smartphones, including without limitation Apple iPhones, which also include a controller for receiving Bluetooth signals.  [7] Samsung Galaxy Buds+ comprise, an electronic device controller for controlling an electronic device (e.g. Smart Phone) by sending an activation signal when the magnetic surface of the set of earphones is decoupled from the one or more magnetically attractable surfaces, wherein the system wirelessly communicates with the electronic device:  [16]

	Galaxy Buds+ also comprise Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.  [23] On information and belief, BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the controller and/or sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]

	 SAMSUNG Galaxy Buds+ GALAXY BUDS+ AUDIO BATTERY DESIGN CONVENIENCE ECOSYSTEM COMPARE SPECS Battery Sensor Accelerometer, IR, Hall, Touch Compatibility [22]

	 [23]

	Also, Samsung Galaxy Buds+ detect if one or more earbuds are decoupled from one or more of the magnets comprising the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnets comprising the holder body, audio stops. The electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one or more of the magnets. When wirelessly paired to a Bluetooth device that is playing audio, one or both Galaxy Buds+ earphones are deactivated and cannot play audio when in the holder. Galaxy Buds+ are compatible with smartphones and tablets running Android 5.0 or higher, including without limitation Samsung Galaxy products, all of which include a controller configured to wirelessly send or receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, Galaxy S10e, S20, S20+ and S20 Ultra 5G. In addition, Galaxy Buds+ are compatible with iPhone7 or later models with iOS10 of higher. [10] Compatible with smartphones and tablet running Android 5.0 or higher and with more than 1.5GB of RAM. Also compatible with iPhone7 or later models with the iOS 10 or higher. [25]

Claim 38	Evidence
38. The system of claim 37 further comprising an earbud engagement detector.	Samsung Galaxy Buds comprise an earbud engagement detector: **Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds** **Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint** SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4] Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that: • Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound. • Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience. • Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques. • Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer. • Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds. • Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials. [4]

	Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.  [14] On information and belief, the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip are responsive to a magnetic Hall sensor:

Samsung Galaxy Buds - The Official Samsung Galaxy Site

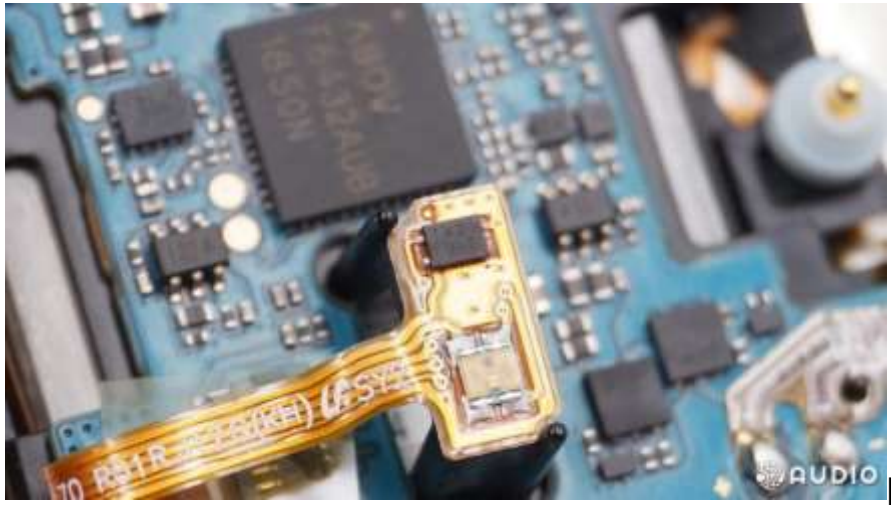
[5]

Broadcom BCM43014

Broadcom is an enormous identify within the wi-fi communications enterprise and has its personal vary of true wi-fi audio chips. The BCM43014 powers the Samsung Galaxy Buds, which had been introduced alongside the Samsung Galaxy S10 collection this 12 months.

The BCM43014 can also be a Bluetooth 5 chip, for what that's price, full with an audio DSP and sensor hub expertise for contact, IR, and proximity sensors. The chip helps quick scan and connection choices to enhance pairing pace. There's no ANC with the Galaxy Buds, however the BCM43014 mentions the combination of superior acoustic algorithms that cut back background noise, which might be out there to different items.

[10]



[14]

The earbud engagement detector detects if one or more magnetically attractable surfaces of the earphones are coupled/decoupled with one or more magnetically attractable surfaces attached to the holder body and accordingly signals the controller to control the Bluetooth paired device.

	 [8] Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command. [8]

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

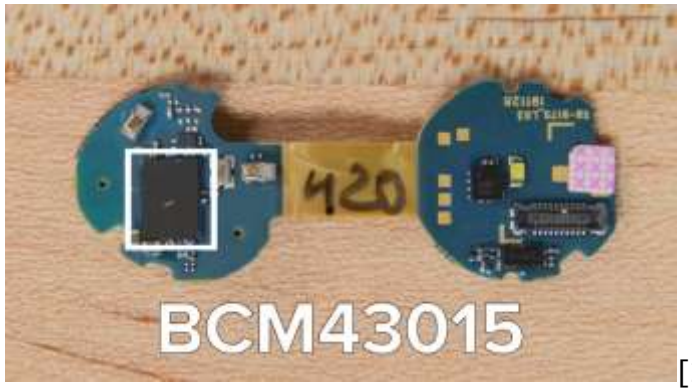
[8]

Also, Samsung Galaxy buds detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces attached to the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnetically attractable surfaces attached to the holder body, audio stops.

The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.

[11]

Samsung Galaxy Buds+ comprise an earbud engagement detector:



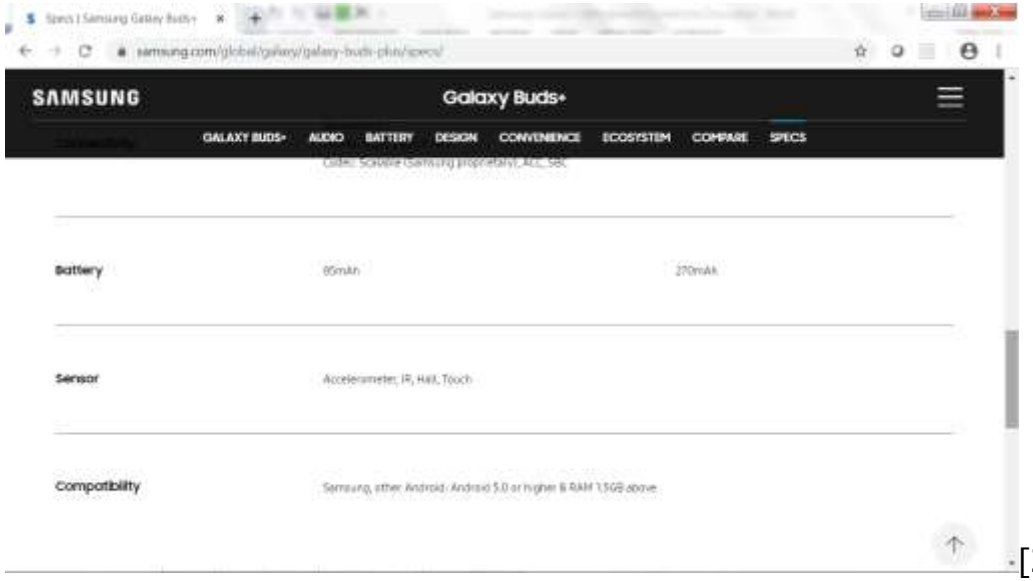
[16]

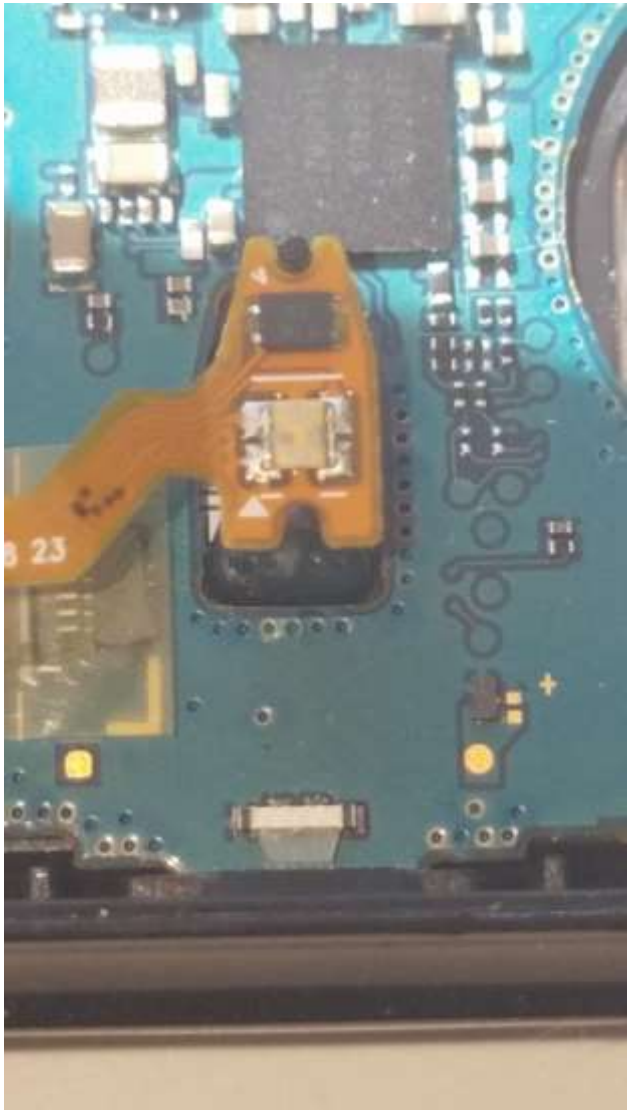
Galaxy Buds+ also comprise Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.

[23]

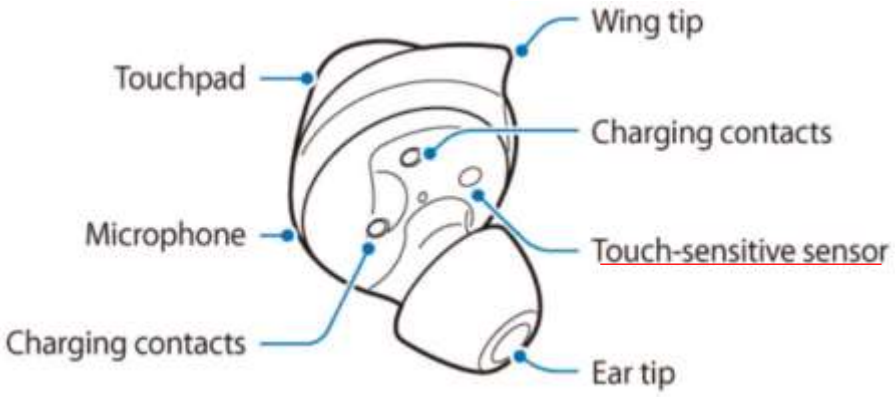
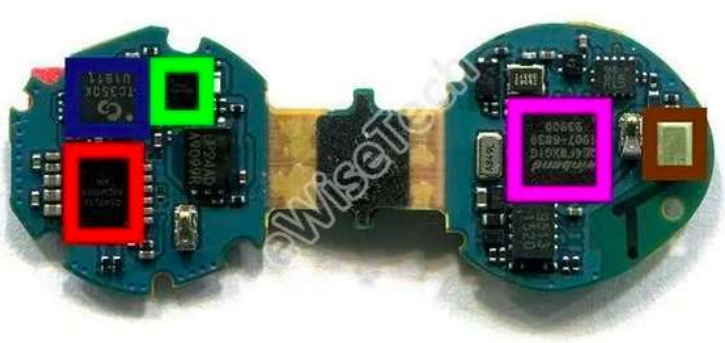
On information and belief, BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the controller and/or sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]

	 SAMSUNG Galaxy Buds+ GALAXY BUDS+ AUDIO BATTERY DESIGN CONVENIENCE ECOSYSTEM COMPARE SPECS Battery Sensor Accelerometer, IR, Hall, Touch Compatibility [22]

	 [23]

	Also, Samsung Galaxy Buds+ detect if one or more earbuds are decoupled from one or more of the magnets comprising the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnets comprising the holder body, audio stops. The electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one or more of the magnets. When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds+ earphones are deactivated and cannot play audio when in the holder. Galaxy Buds+ are compatible with smartphones and tablets running Android 5.0 or higher, including without limitation Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, Galaxy S10e, S20, S20+ and S20 Ultra 5G. In addition, Galaxy Buds+ are compatible with iPhone7 or later models with iOS10 of higher. [10] Compatible with smartphones and tablet running Android 5.0 or higher and with more than 1.5GB of RAM. Also compatible with iPhone7 or later models with the iOS 10 or higher. [25]

Claim 39	Evidence
39. The system of claim 37 wherein the touch sensor detector receives a signal from the touch sensor and sends a signal to the electronic device controller.	Samsung Galaxy Buds comprise a touch sensor detector that receives a signal from the touch sensor and further sends the signal to the electronic device controller:  [1]  Blue: CORERIVER-TC350K-CapacitiveTouch Sensor Controller [15]

Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds

Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint

SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4]

Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that:

- Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound.
- Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience.
- Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques.
- Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer.
- Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds.
- Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials.

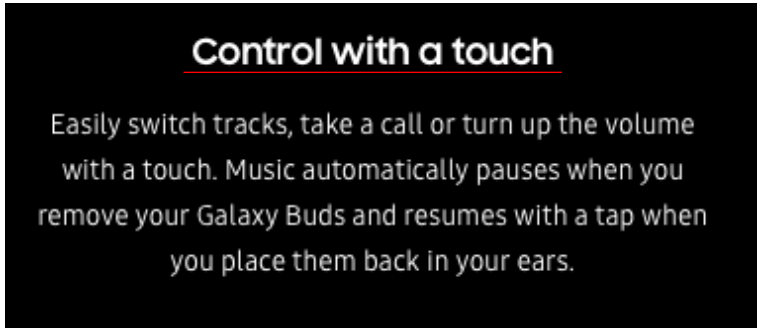
[4]

On information and belief, the sensor hub of the BCM43014 System on Chip is responsive to a touch sensor incorporated in Galaxy Buds:


Dimensions & Weight
SAMSUNG
Ear Buds
17.5 x 22.5 x 19.2mm
5.6g
Cradle
70 x 38.8 x 26.5mm
39.6g
Performance
AP
BCM43014


Sensor
Accelerometer, Proximity, Hall, Touch

[5]



[9]

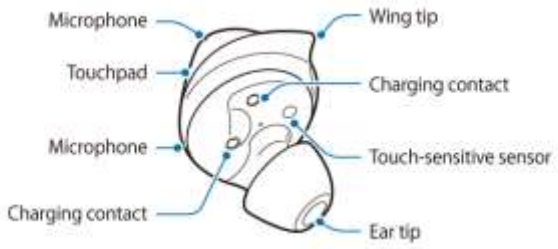
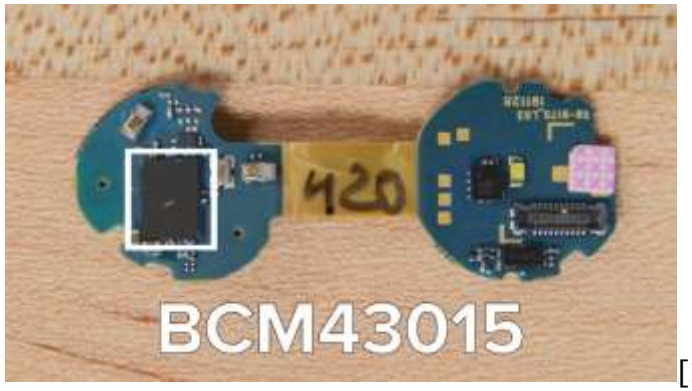
Touchpad commands for Galaxy Buds

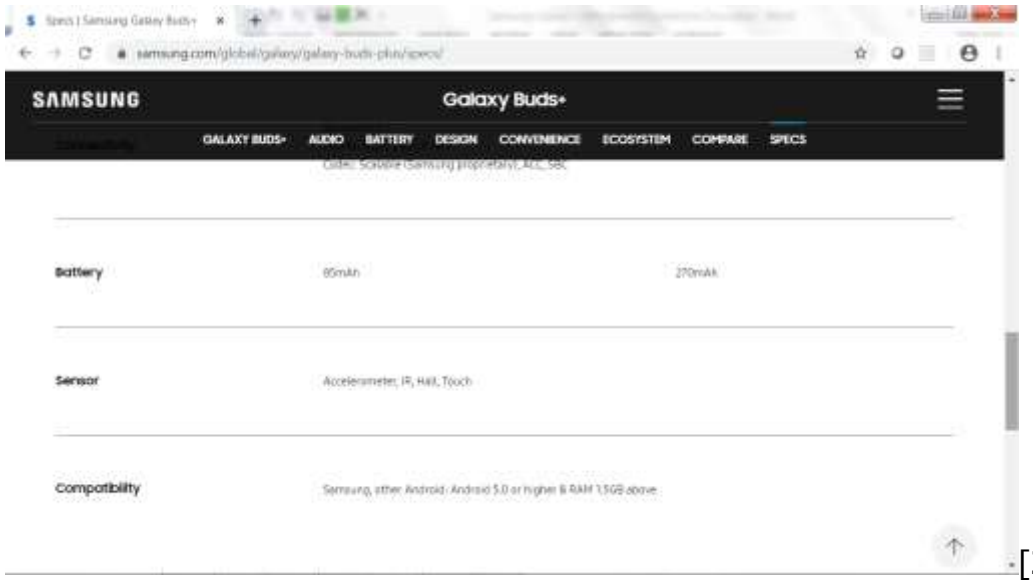
Earbud touchpad commands

All the controls you need are at your fingertips with the touchpads on your earbuds.

- Tap the touchpad to play or pause music.
- To skip songs or answer/end phone calls, quickly tap the touchpad two times. If you want to answer a second call or switch between calls, quickly tap the touchpad two times.
- To play the previous song during music playback, quickly tap the touchpad three times. If your triple tap the touchpad three seconds after the track starts to play, the current track will restart instead.
- To reject a call, touch and hold the touchpad for more than two seconds.
- When you want to end the current call and retrieve a call placed on hold, touch and hold the touchpad for more than two seconds.

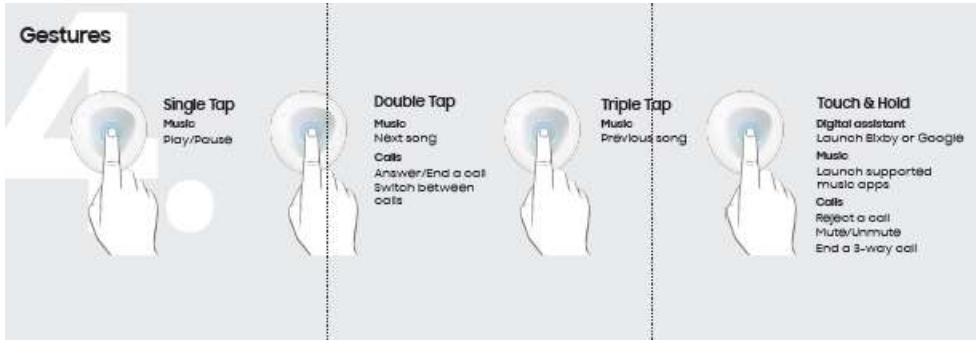
[12]

	Samsung Galaxy Buds+ comprise a touch sensor detector that receives a signal from the touch sensor and further sends a signal to the electronic device controller:  [24]  [16] On information and belief, the BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the sensor hub of the BCM43015 System on Chip is responsive to a touch sensor incorporated in Galaxy Buds+:



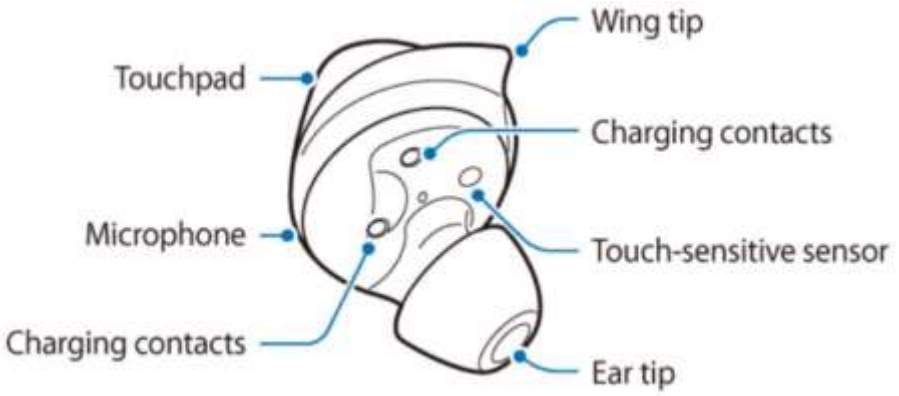
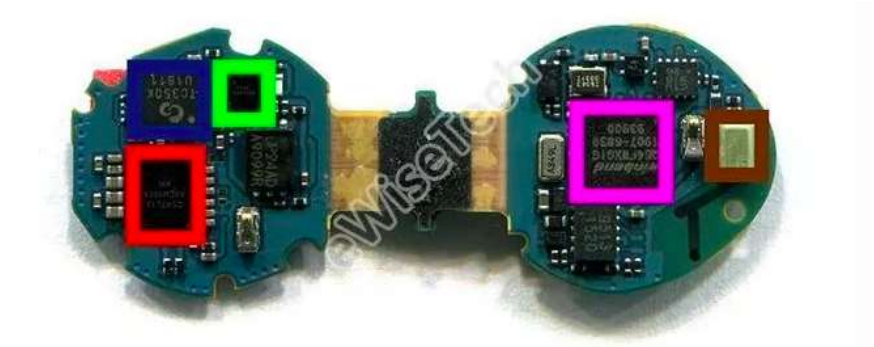
[22]

Samsung Galaxy Buds+ comprise a touch sensor detector to sense the various gestures performed on earbud's touchpad and the touch sensor detector in the erbuds sends a signal to the electronic device controller:



[21]

	 [26] On information and belief, Samsung Galaxy Buds+ include a touch sensor controller.

Claim 40	Evidence
40. The system of claim 39 wherein the touch sensor detector sends a signal to the electronic device controller that the touch sensor has been tapped, double-tapped, or swiped.	Samsung Galaxy Buds comprise a touch sensor detector that receives a signal from the touch sensor and further sends a signal to the electronic device controller that the touch sensor has been tapped, double-tapped, or swiped:  [1]  Blue: CORERIVER-TC350K-CapacitiveTouch Sensor Controller [15]

Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds

Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint

SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4]

Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that:

- Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound.
- Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience.
- Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques.
- Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer.
- Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds.
- Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials.

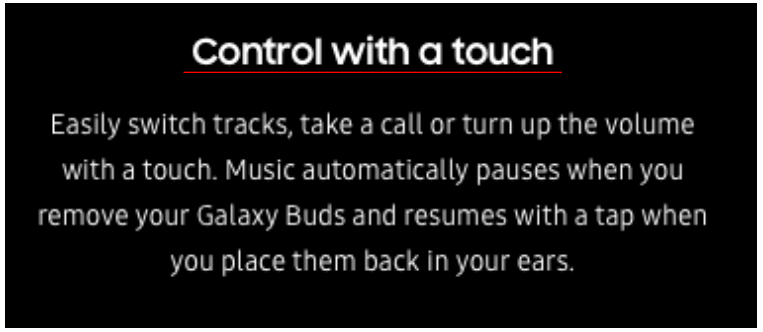
[4]

On information and belief, the sensor hub of the BCM43014 System on Chip is responsive to a touch sensor incorporated in Galaxy Buds:


Dimensions & Weight
SAMSUNG
Ear Buds
17.5 x 22.5 x 19.2mm
5.6g
Cradle
70 x 38.8 x 26.5mm
39.6g
Performance
AP
BCM43014


Samsung Galaxy Buds - The Official Samsung Galaxy Site
Sensor
Accelerometer, Proximity, Hall, Touch

[5]



[9]

Touchpad commands for Galaxy Buds

Earbud touchpad commands

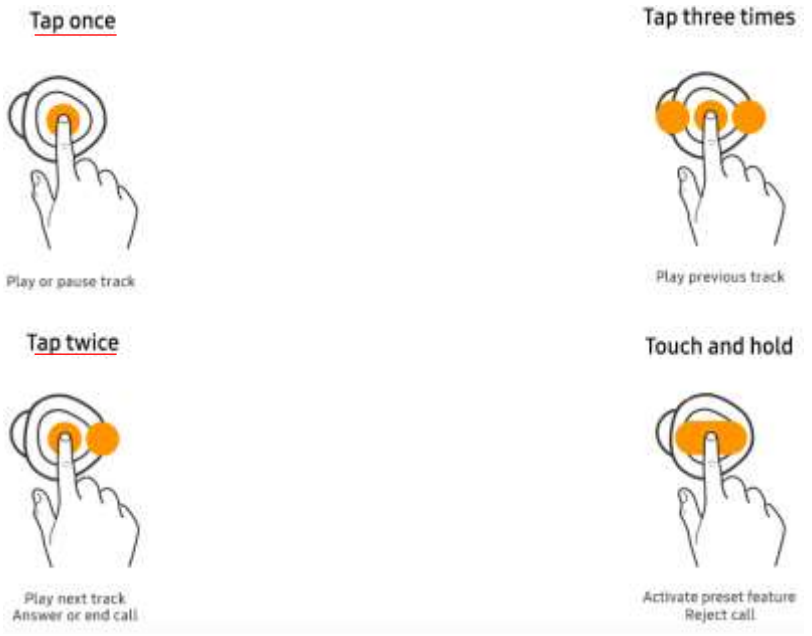
All the controls you need are at your fingertips with the touchpads on your earbuds.

- Tap the touchpad to play or pause music.
- To skip songs or answer/end phone calls, quickly tap the touchpad two times. If you want to answer a second call or switch between calls, quickly tap the touchpad two times.
- To play the previous song during music playback, quickly tap the touchpad three times. If your triple tap the touchpad three seconds after the track starts to play, the current track will restart instead.
- To reject a call, touch and hold the touchpad for more than two seconds.
- When you want to end the current call and retrieve a call placed on hold, touch and hold the touchpad for more than two seconds.

[12]

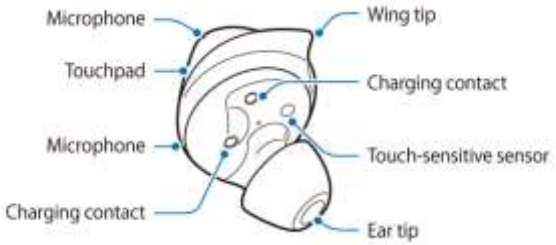
Galaxy Buds touch gestures

Check out this handy visual guide that breaks down all the touch gestures for Galaxy Buds. Depending on the circumstances, these gestures may perform a different task.

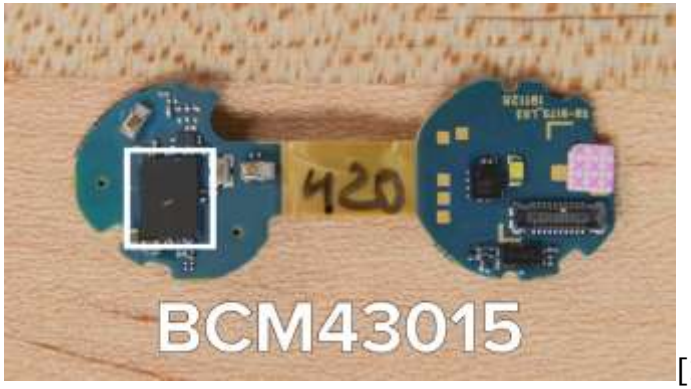


[12]

Samsung Galaxy Buds+ comprise a touch sensor detector that receives a signal from the touch sensor and further sends a signal to the electronic device controller that the touch sensor has been tapped, double-tapped, or swiped:



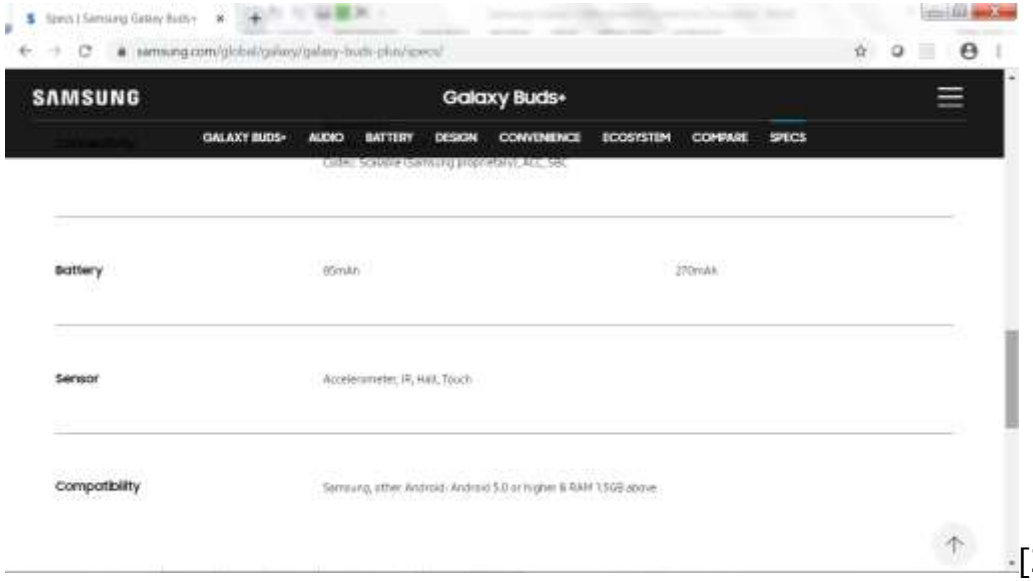
[24]



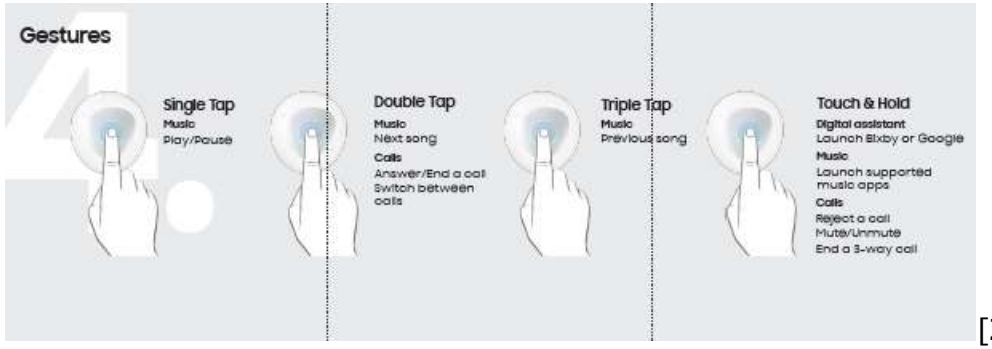
[16]

On information and belief, the BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the sensor hub of the BCM43015 System on Chip is responsive to a touch sensor incorporated in Galaxy Buds+:

The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]

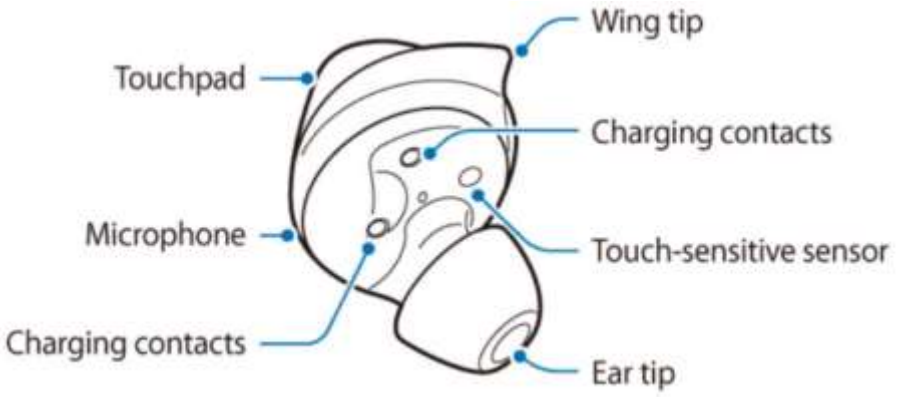
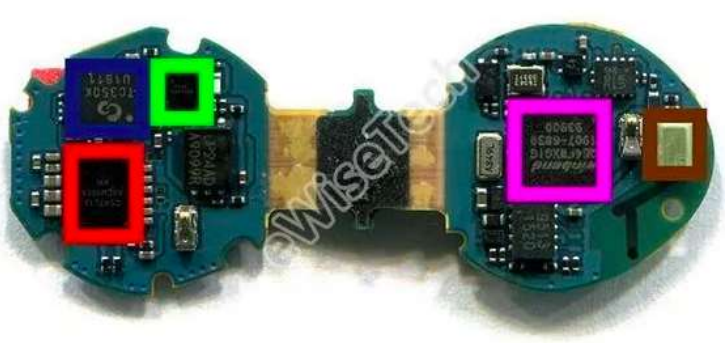

SAMSUNG
Galaxy Buds+
GALAXY BUDS+
AUDIO
BATTERY
DESIGN
CONVENIENCE
ECOSYSTEM
COMPARE
SPECS
Battery
Sensor
Compatibility

[22]


Gestures
Single Tap
Music
Play/Pause
Double Tap
Music
Next song
Calls
Answer/End a call
Switch between calls
Triple Tap
Music
Previous song
Touch & Hold
Digital assistant
Launch Bixby or Google
Music
Launch supported music apps
Calls
Reject a call
Mute/Unmute
End a 3-way call

[21]

	 [26] On information and belief, Samsung Galaxy Buds+ include a touch sensor controller.

Claim 41	Evidence
41. The system of claim 39 wherein the electronic device controller sends a signal to an electronic device to operate the electronic device based upon the signal from the touch sensor detector.	Samsung Galaxy buds comprise an electronic device controller which sends a signal to an electronic device to operate the electronic device based upon the signal from the touch sensor detector:  [1]  Blue: CORERIVER-TC350K-CapacitiveTouch Sensor Controller [15]

Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds

Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint

SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4]

Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that:

- Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound.
- Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience.
- Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques.
- Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer.
- Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds.
- Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials.

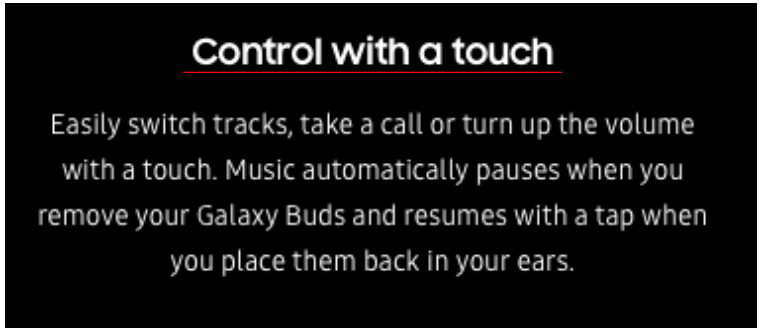
[4]

On information and belief, the sensor hub of the BCM43014 System on Chip is responsive to a touch sensor incorporated in Galaxy Buds:


Dimensions & Weight
SAMSUNG
Ear Buds
17.5 x 22.5 x 19.2mm
5.6g
Cradle
70 x 38.8 x 26.5mm
39.6g
Performance
AP
BCM43014


Samsung Galaxy Buds - The Official Samsung Galaxy Site
Sensor
Accelerometer, Proximity, Hall, Touch

[5]



[9]

The operation like answering/ending a call or playing/pausing music on a Bluetooth paired device (e.g. Smartphone) can be done by performing various gestures (e.g. Single-tap, double-tap) on the touchpad of the earbuds:

Touchpad commands for Galaxy Buds

Earbud touchpad commands

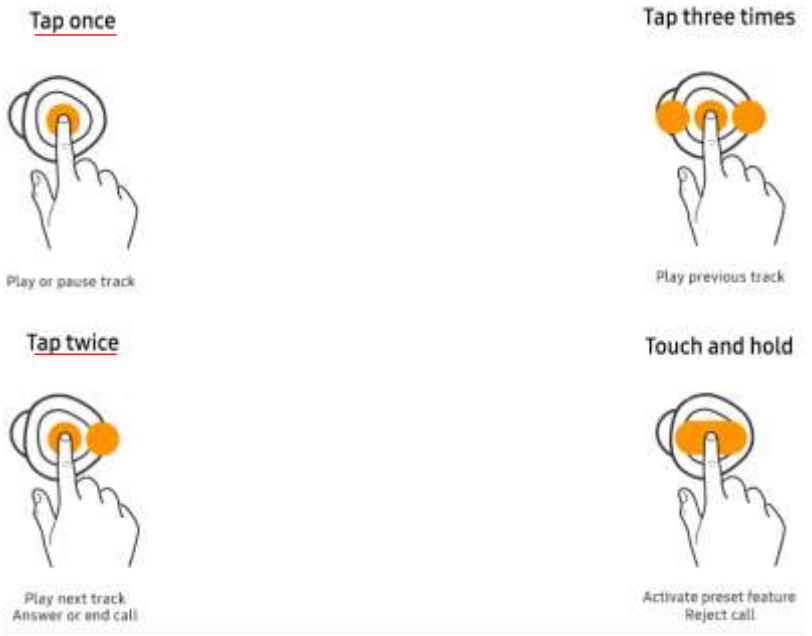
All the controls you need are at your fingertips with the touchpads on your earbuds.

- Tap the touchpad to play or pause music.
- To skip songs or answer/end phone calls, quickly tap the touchpad two times. If you want to answer a second call or switch between calls, quickly tap the touchpad two times.
- To play the previous song during music playback, quickly tap the touchpad three times. If your triple tap the touchpad three seconds after the track starts to play, the current track will restart instead.
- To reject a call, touch and hold the touchpad for more than two seconds.
- When you want to end the current call and retrieve a call placed on hold, touch and hold the touchpad for more than two seconds.

[12]

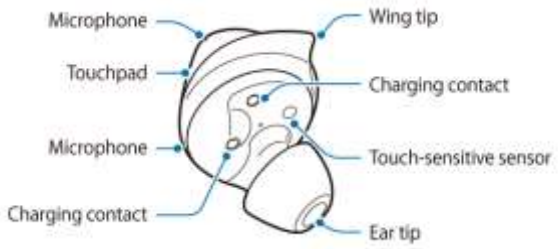
Galaxy Buds touch gestures

Check out this handy visual guide that breaks down all the touch gestures for Galaxy Buds. Depending on the circumstances, these gestures may perform a different task.

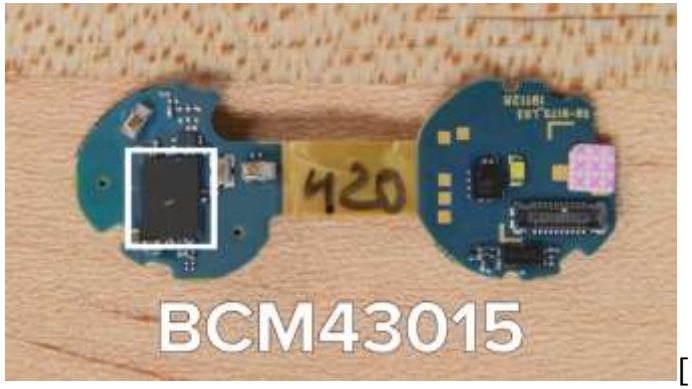


[12]

Samsung Galaxy Buds+ comprise a touch sensor detector that receives a signal from the touch sensor and further sends a signal to the electronic device to activate or deactivate the electronic device:



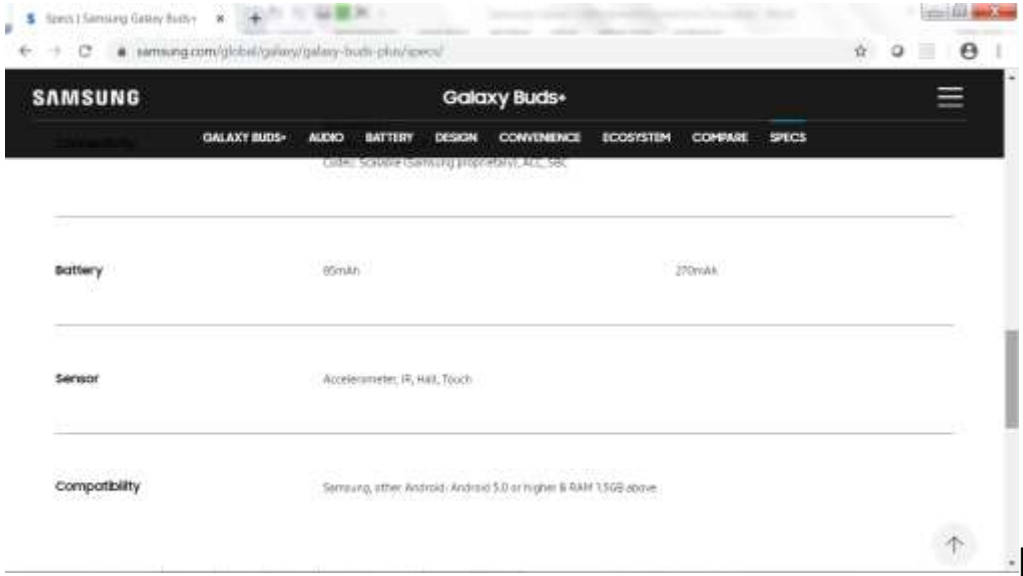
[24]



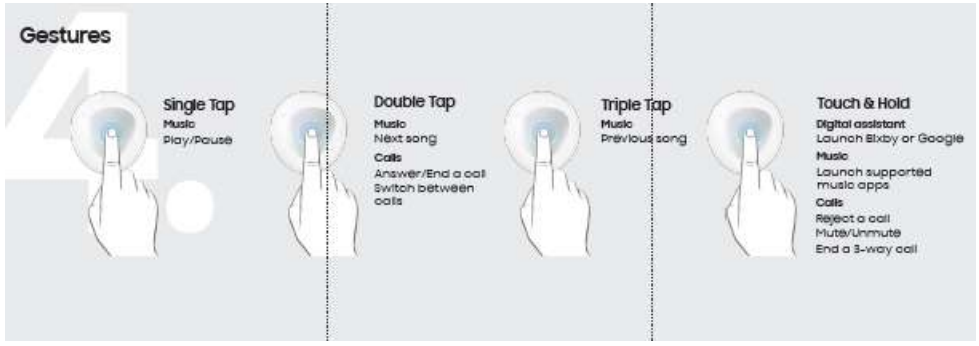
[16]

On information and belief, the BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the sensor hub of the BCM43015 System on Chip is responsive to a touch sensor incorporated in Galaxy Buds+:

The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]

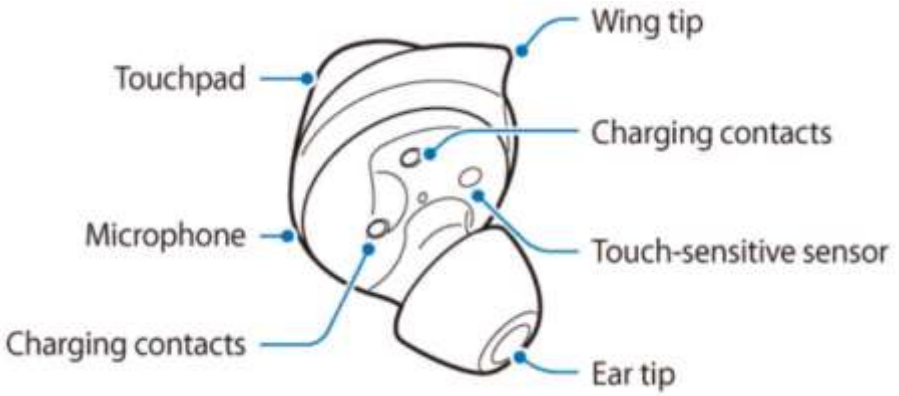
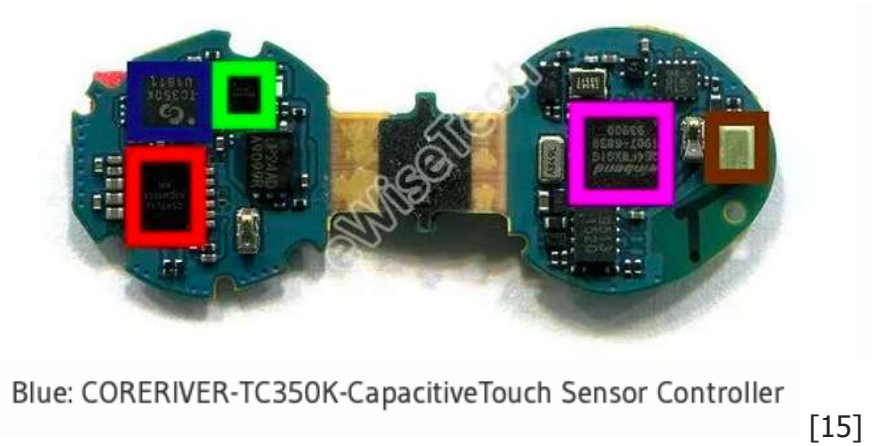

SAMSUNG
Galaxy Buds+
GALAXY BUDS+
AUDIO
BATTERY
DESIGN
CONVENIENCE
ECOSYSTEM
COMPARE
SPECS
Battery
Sensor
Compatibility

[22]


Gestures
Single Tap
Music
Play/Pause
Double Tap
Music
Next song
Calls
Answer/End a call
Switch between calls
Triple Tap
Music
Previous song
Touch & Hold
Digital assistant
Launch Bixby or Google
Music
Launch supported music apps
Calls
Reject a call
Mute/Unmute
End a 3-way call

[21]

	 [26] On information and belief, Samsung Galaxy Buds+ include a touch sensor controller.

Claim 42	Evidence
42. The system of claim 41 wherein the touch sensor detector sends a signal to the electronic device to activate or deactivate the electronic device.	Samsung Galaxy buds comprise a touch sensor detector which sends a signal to the electronic device to activate or deactivate the electronic device:  [1]  Blue: CORERIVER-TC350K-CapacitiveTouch Sensor Controller [15]

Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds

Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint

SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4]

Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that:

- Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound.
- Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience.
- Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques.
- Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer.
- Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds.
- Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials.

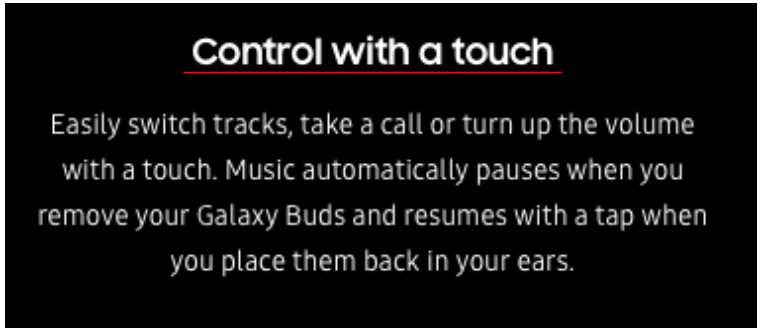
[4]

On information and belief, the sensor hub of the BCM43014 System on Chip is responsive to a Touch sensor incorporated in Galaxy Buds:


Dimensions & Weight
SAMSUNG
Ear Buds
17.5 x 22.5 x 19.2mm
5.6g
Cradle
70 x 38.8 x 26.5mm
39.6g
Performance
AP
BCM43014


Samsung Galaxy Buds - The Official Samsung Galaxy Site
Sensor
Accelerometer, Proximity, Hall, Touch

[5]



[9]

The operation like answering/ending a call or playing/pausing music on a Bluetooth paired device (e.g. Smartphone) can easily be done by performing various gestures (e.g. Single tap, double-tap) on the touchpad of the earbuds.

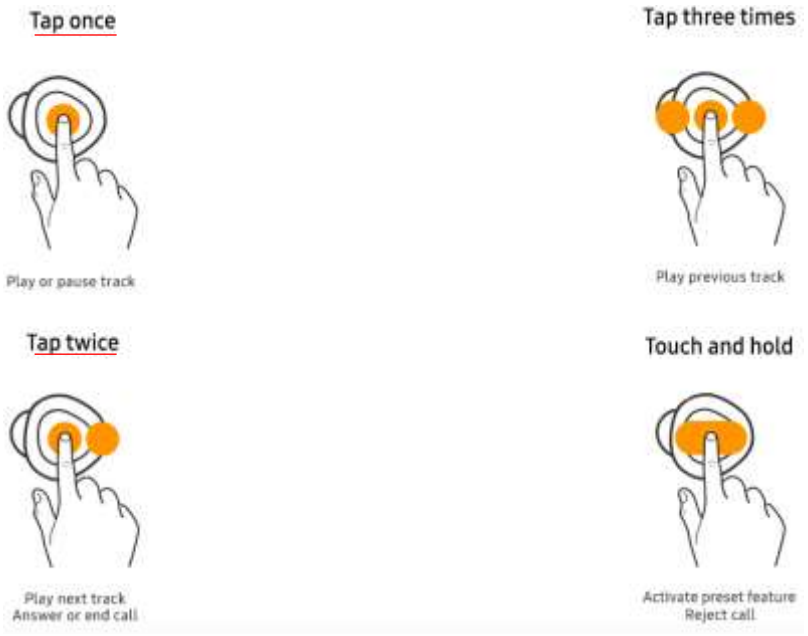
Also, by using tap and hold gesture on earbuds touchpad, a conversation with voice assistance can be initiated:

Using the touchpad

You can control music playback, answer or reject calls, and start a conversation with Bixby using the touchpad. [1]

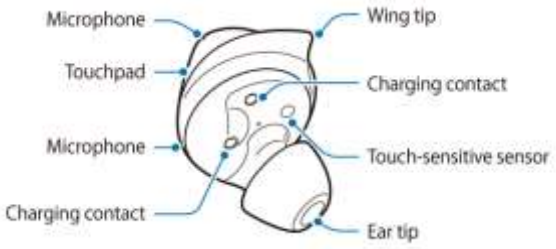
Touchpad commands for Galaxy Buds

	Earbud touchpad commands All the controls you need are at your fingertips with the touchpads on your earbuds. • Tap the touchpad to play or pause music. • To skip songs or answer/end phone calls, quickly tap the touchpad two times. If you want to answer a second call or switch between calls, quickly tap the touchpad two times. • To play the previous song during music playback, quickly tap the touchpad three times. If your triple tap the touchpad three seconds after the track starts to play, the current track will restart instead. • To reject a call, touch and hold the touchpad for more than two seconds. • When you want to end the current call and retrieve a call placed on hold, touch and hold the touchpad for more than two seconds. [12] **Galaxy Buds touch gestures** Check out this handy visual guide that breaks down all the touch gestures for Galaxy Buds. Depending on the circumstances, these gestures may perform a different task.

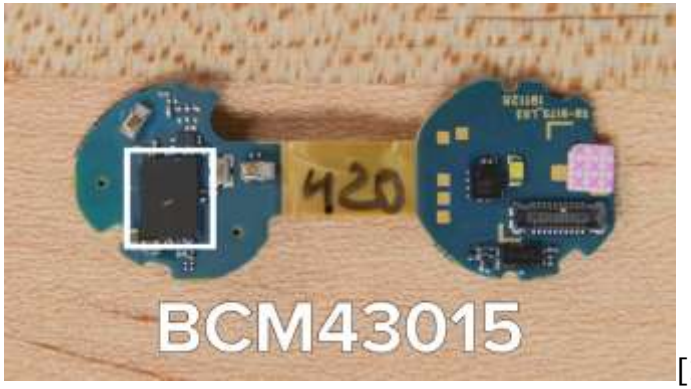


[12]

Samsung Galaxy Buds+ comprise a touch sensor detector that receives a signal from the touch sensor and further sends a signal to the electronic device controller that the touch sensor has been tapped, double-tapped, or swiped:



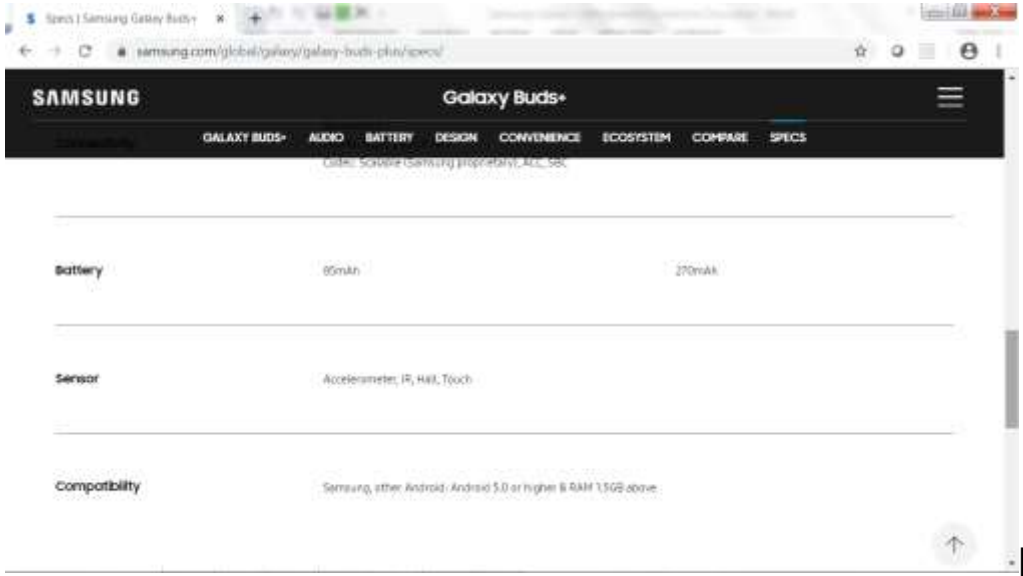
[24]



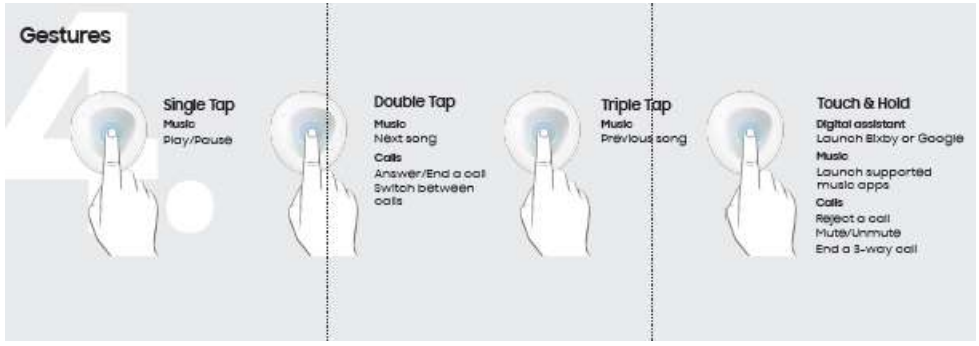
[16]

On information and belief, the BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the sensor hub of the BCM43015 System on Chip is responsive to a touch sensor incorporated in Galaxy Buds+:

The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]


SAMSUNG
Galaxy Buds+
GALAXY BUDS+
AUDIO
BATTERY
DESIGN
CONVENIENCE
ECOSYSTEM
COMPARE
SPECS
Battery
Sensor
Compatibility

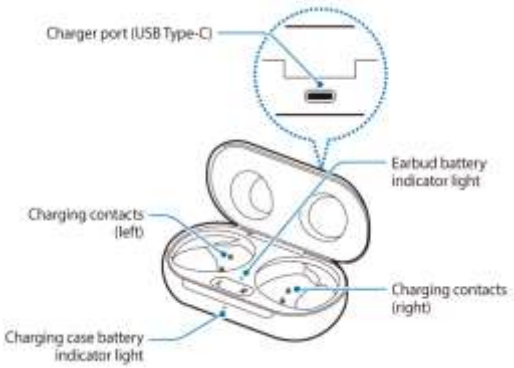
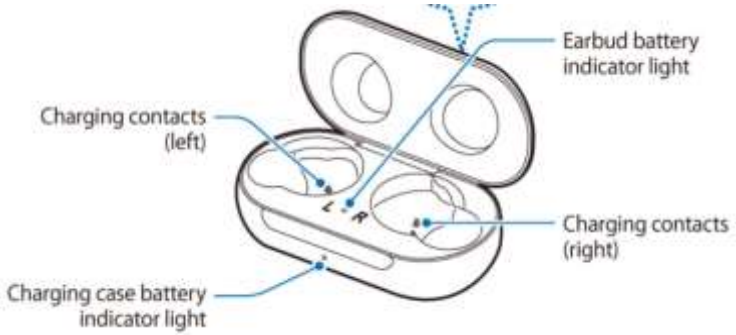
[22]

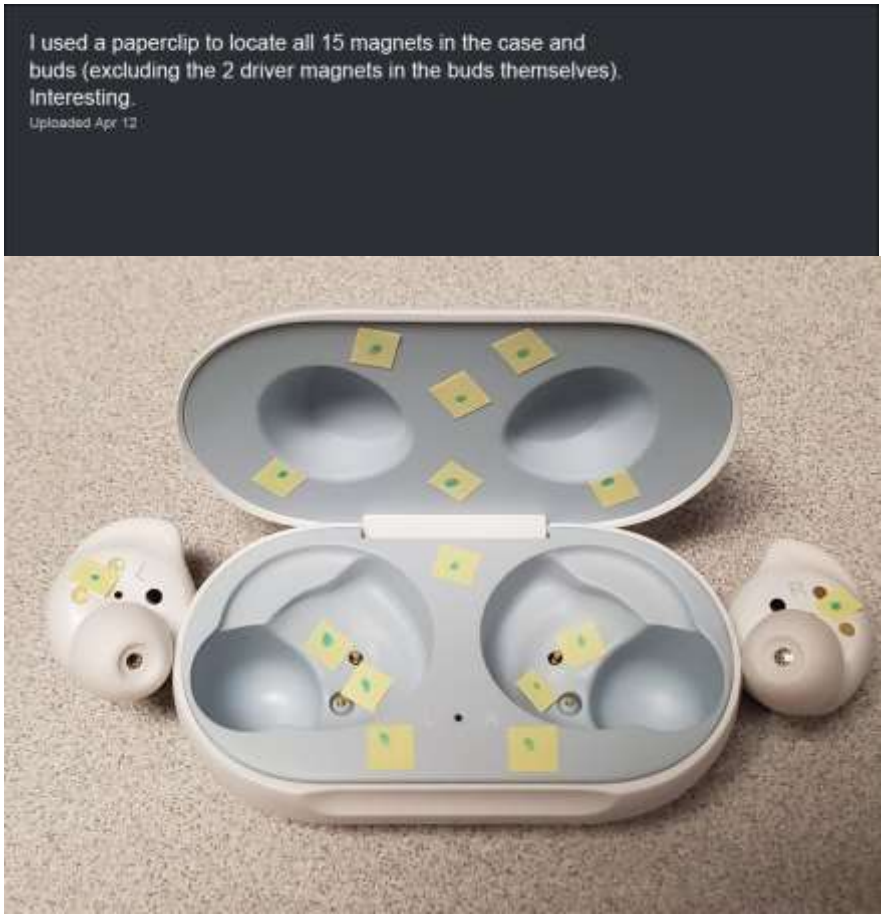

Gestures
Single Tap
Music
Play/Pause
Double Tap
Music
Next song
Calls
Answer/End a call
Switch between calls
Triple Tap
Music
Previous song
Touch & Hold
Digital assistant
Launch Bixby or Google
Music
Launch supported music apps
Calls
Reject a call
Mute/Unmute
End a 3-way call

[21]

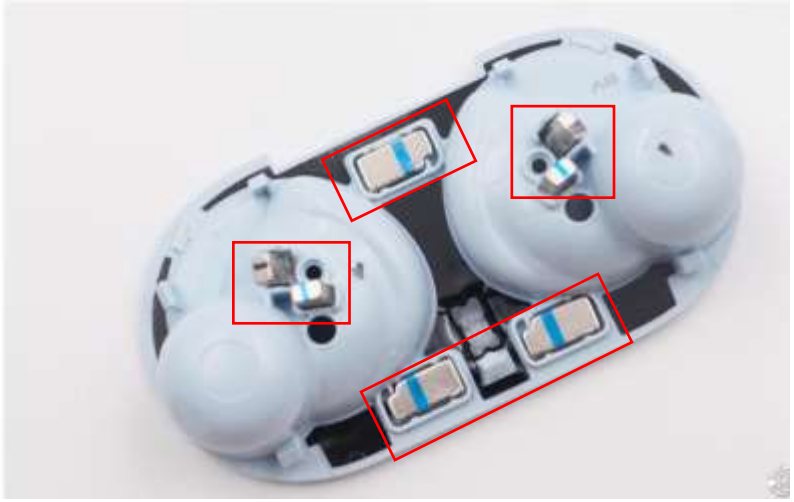
	 [26] On information and belief, Samsung Galaxy Buds+ include a touch sensor controller.

Claim 54	Evidence
54[pre]. An earphones holder comprising:	The Preamble is non-limiting. *STX LLC. v. Brine*, 211 F.3d 588, 591, 54 USPQ2d 1347, 1350 (Fed. Cir. 2000) (preamble that states a purpose or intended use for the invention is not limiting).
54[a] a holder body;	Samsung Galaxy Buds comprise a charging case: **Power up to power on.** Get up to 13 hours[1] of battery life when you are on the go with a case that doubles as a wireless charger for your wireless earbuds. One full charge provides up to six hours[1] of play time and the charging case provides up to an additional seven hours.[1] Running low on power but in a rush to get out the door? A quick 15-minute charge in the case will get you up to 1.7 hours of play time.  [9] Samsung Galaxy Buds+ comprise a charging case:

	 [24]
54[b] one or more magnets attached to the holder body;	Samsung Galaxy Buds comprise a charging case with one or more magnets:  [1] Galaxy Buds: Features The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go. [2]


I used a paperclip to locate all 15 magnets in the case and buds (excluding the 2 driver magnets in the buds themselves). Interesting.
Uploaded Apr 12

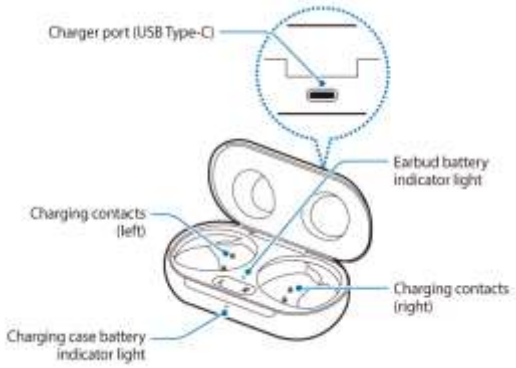
[3]



采用多颗磁铁辅助耳机定位。 [14]

English Translation: Use multiple magnets to assist in headphone positioning

Samsung Galaxy Buds+ comprise a charging case with one or more magnets:



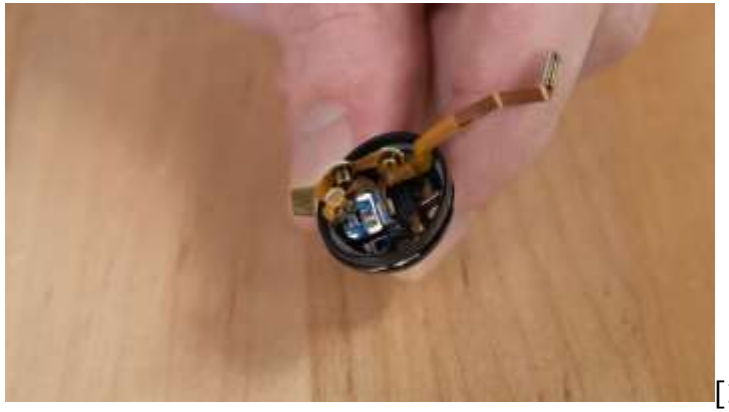
[24]


[23]


[23]

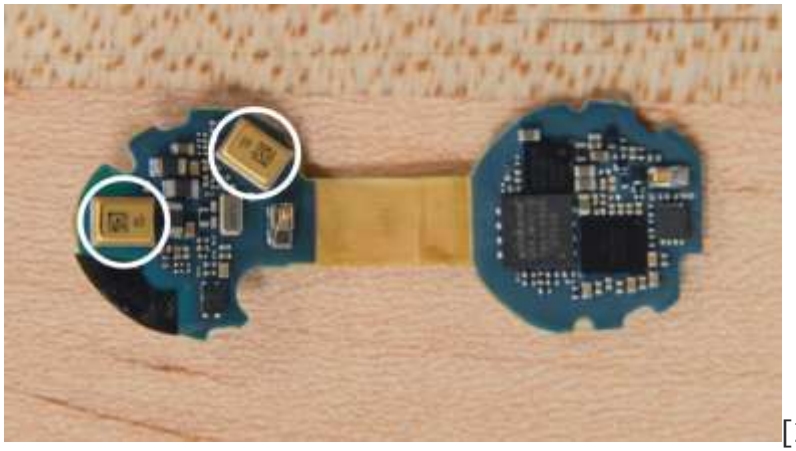
Your device contains magnets, which may affect medical devices, such as pacemakers or implantable cardioverter defibrillators. If you are using any of these medical devices, keep your device a safe distance from them and consult with your physician before you use the device. [24]

[16]



[16]

The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]

	 [16]
54[c] an earbud engagement detector; and	Samsung Galaxy Buds comprise an earbud engagement detector: **Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds** **Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint** SAN JOSE, Calif., Feb. 26, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4]

Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that:

- Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound.
- Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience.
- Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques.
- Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer.
- Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds.
- Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials.

[4]

Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

[14]

On information and belief, the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip are responsive to a magnetic Hall sensor:

Samsung Galaxy Buds - The Official Samsung Galaxy Site

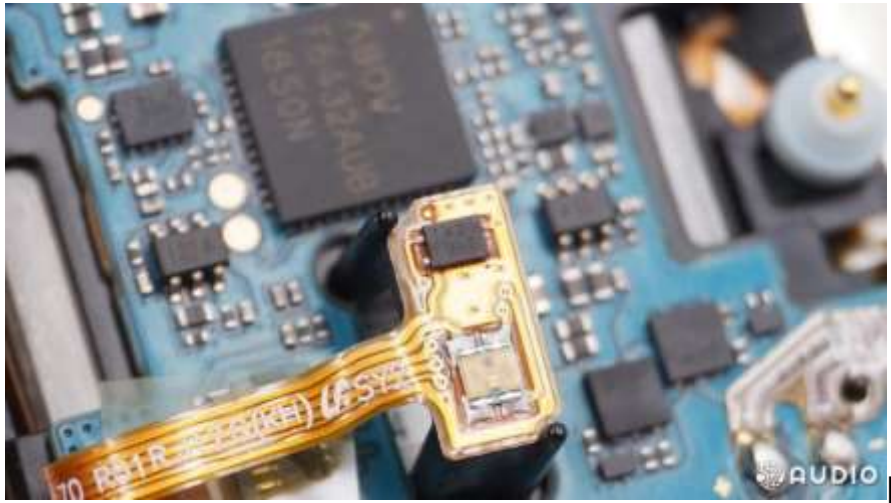
[5]

Broadcom BCM43014

Broadcom is an enormous identify within the wi-fi communications enterprise and has its personal vary of true wi-fi audio chips. The BCM43014 powers the Samsung Galaxy Buds, which had been introduced alongside the Samsung Galaxy S10 collection this 12 months.

The BCM43014 can also be a Bluetooth 5 chip, for what that's price, full with an audio DSP and sensor hub expertise for contact, IR, and proximity sensors. The chip helps quick scan and connection choices to enhance pairing pace. There's no ANC with the Galaxy Buds, however the BCM43014 mentions the combination of superior acoustic algorithms that cut back background noise, which might be out there to different items.

[10]



[14]

The smartphone is activated when the detector detects that one or more magnet of the earphones has been decoupled from the one or more magnetically attractable surfaces of the holder:

	 [8] Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command. [8]

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

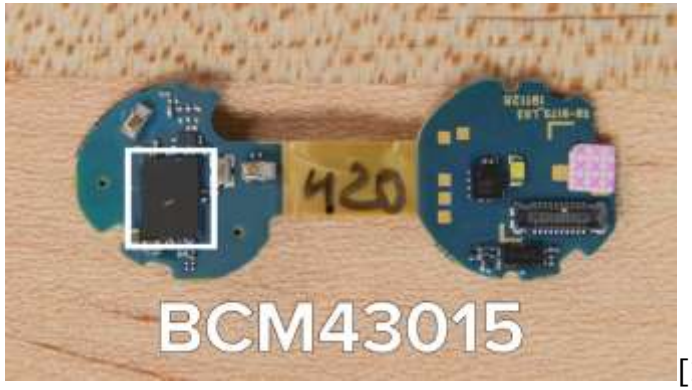
[8]

Also, Samsung Galaxy buds detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces attached to the holder body and accordingly controls the sound output in the earbuds.

The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.

[11]

Samsung Galaxy Buds+ comprise an earbud engagement detector:



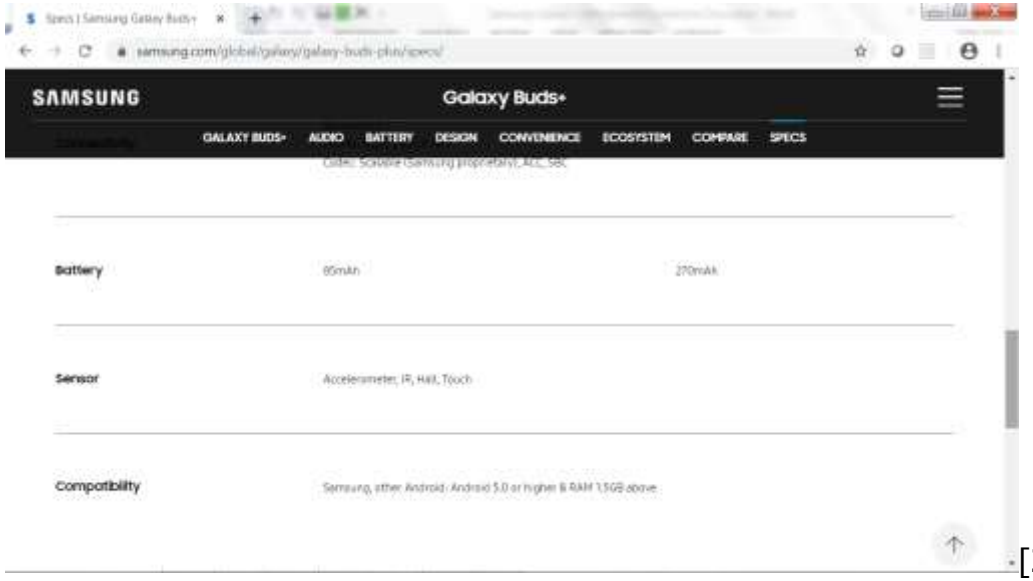
[16]

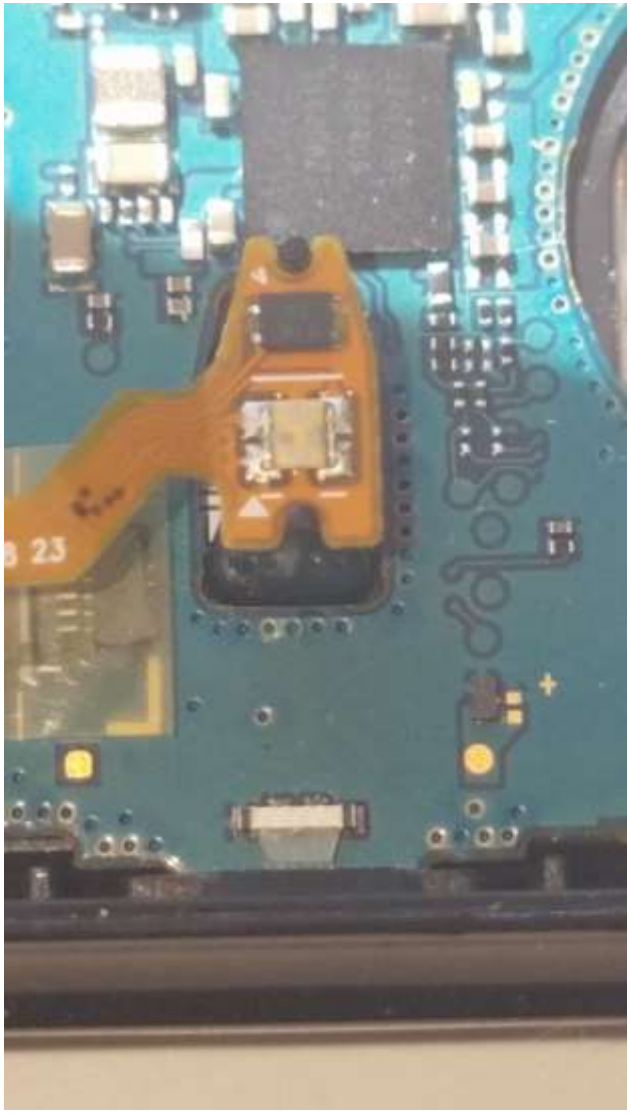
Galaxy Buds+ also comprise Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.

[23]

On information and belief, BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the controller and/or sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]

	 SAMSUNG Galaxy Buds+ GALAXY BUDS+ AUDIO BATTERY DESIGN CONVENIENCE ECOSYSTEM COMPARE SPECS Battery Sensor Accelerometer, IR, Hall, Touch Compatibility [22]



[23]

	Also, Samsung Galaxy Buds+ detect if one or more earbuds are decoupled from one or more of the magnets comprising the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnets comprising the holder body, audio stops. The electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one or more of the magnets. When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds+ earphones are deactivated and cannot play audio when in the holder. Galaxy Buds+ are compatible with smartphones and tablets running Android 5.0 or higher, including without limitation Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, Galaxy S10e, S20, S20+ and S20 Ultra 5G. In addition, Galaxy Buds+ are compatible with iPhone7 or later models with iOS10 of higher. [10] Compatible with smartphones and tablet running Android 5.0 or higher and with more than 1.5GB of RAM. Also compatible with iPhone7 or later models with the iOS 10 or higher. [25]

54[d] an electronic device controller for controlling an electronic device coupled to the earphones, wherein a metal portion of the earphones removably couples with the one or more magnets, further wherein the electronic device controller sends an activation signal to the electronic device when the earbud engagement detector detects that the metal portion of the earphones has been decoupled from the one or more magnets.	Samsung Galaxy Buds comprise, an electronic device controller for controlling an electronic device (e.g. Smart Phone) coupled to the earphones: **Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds** **Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint** SAN JOSE, Calif., Feb. 26, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4] Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that: • Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound. • Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience. • Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques. • Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer. • Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds. • Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials. [4] Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

	 [14] On information and belief, the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip are responsive to a magnetic Hall sensor:

Samsung Galaxy Buds - The Official Samsung Galaxy Site

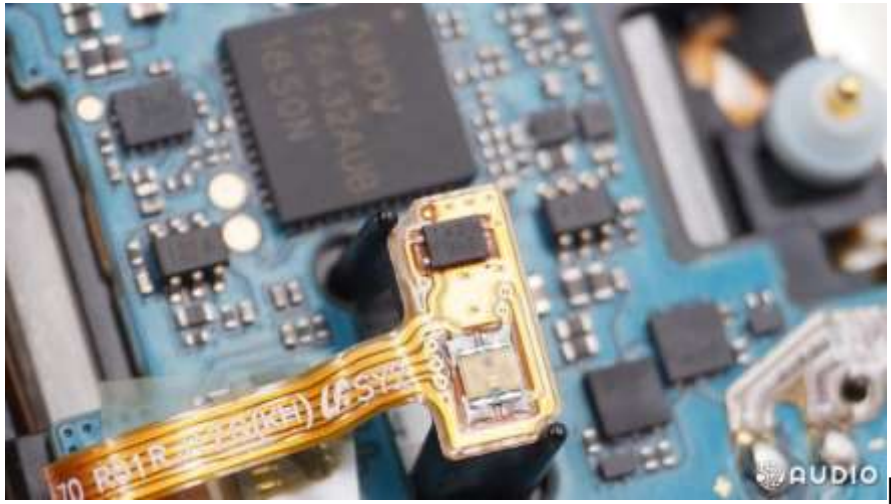
[5]

Broadcom BCM43014

Broadcom is an enormous identify within the wi-fi communications enterprise and has its personal vary of true wi-fi audio chips. The BCM43014 powers the Samsung Galaxy Buds, which had been introduced alongside the Samsung Galaxy S10 collection this 12 months.

The BCM43014 can also be a Bluetooth 5 chip, for what that's price, full with an audio DSP and sensor hub expertise for contact, IR, and proximity sensors. The chip helps quick scan and connection choices to enhance pairing pace. There's no ANC with the Galaxy Buds, however the BCM43014 mentions the combination of superior acoustic algorithms that cut back background noise, which might be out there to different items.

[10]



[14]

The smartphone is activated when the detector detects that one or more magnet of the earphones has been decoupled from the one or more magnetically attractable surfaces of the holder:

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

[8]

Also, Samsung Galaxy buds detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces attached to the holder body and accordingly control the sound output in the earbuds.

The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.

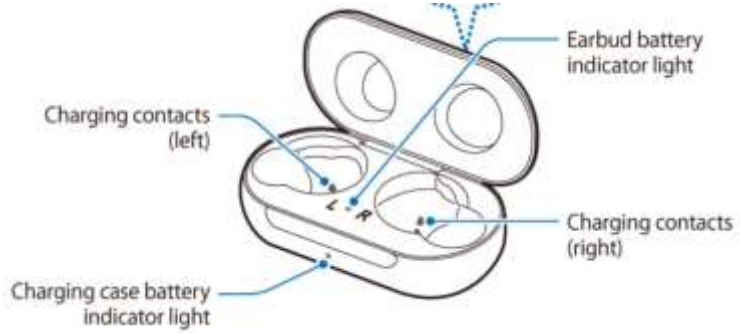
[11]

When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds earphones activate and begin playing audio when removed from the charging case.

[6]

On information and belief, Galaxy Buds are compatible with Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, and Galaxy S10e.

[5]

	On information and belief, Galaxy Buds are also compatible with other smartphones, including without limitation Apple iPhones, which also include a controller for receiving Bluetooth signals. **Android & iOS compatible** The Galaxy Buds pair with both Android and iOS compatible smartphones via Bluetooth connection.[4] [7] Also, the metal portion (Magnetic part) of the earbuds can removably couple with the one or more magnets:  [1]

Galaxy Buds: Features

The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go.

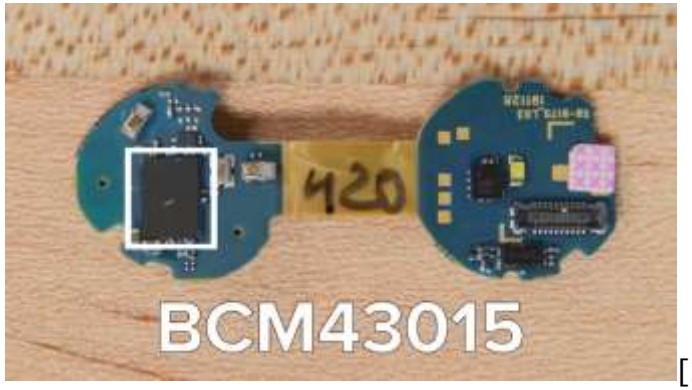
[2]

As with the AirPods, Samsung's wireless headphones employ the use of magnets to align the buds perfectly to the charging contacts inside the case, while keeping them secure in the case upon opening the top cover.

The charging case features a pair of contacts for each earbud that aligns with the two contacts on the Galaxy Buds. Thanks to the magnetic alignment, users can simply place the buds inside the charging case and rest assured knowing that they'll begin charging automatically.

[13]

Samsung Galaxy Buds+ comprise an earbud engagement detector:



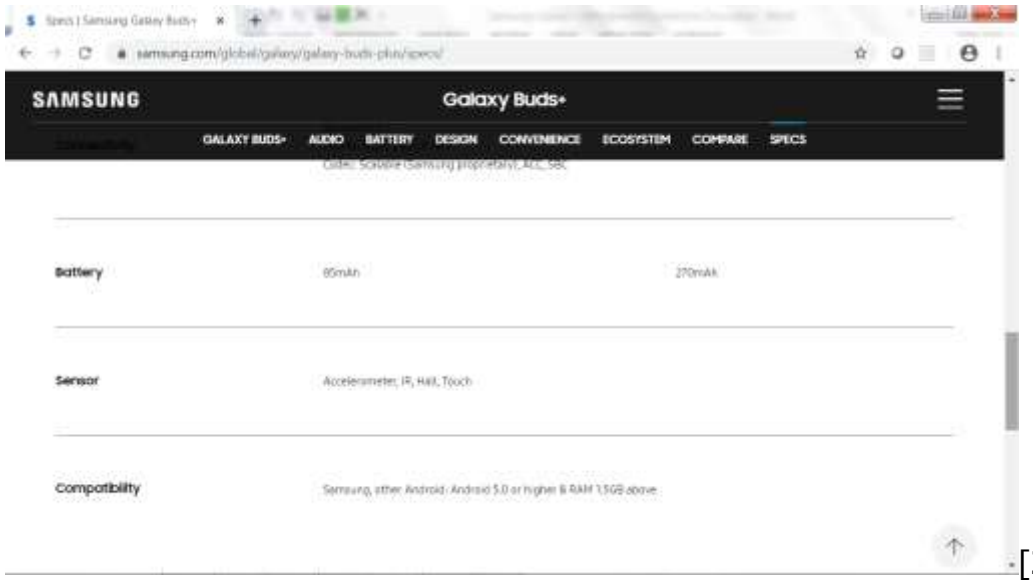
[16]

Galaxy Buds+ also comprise Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.

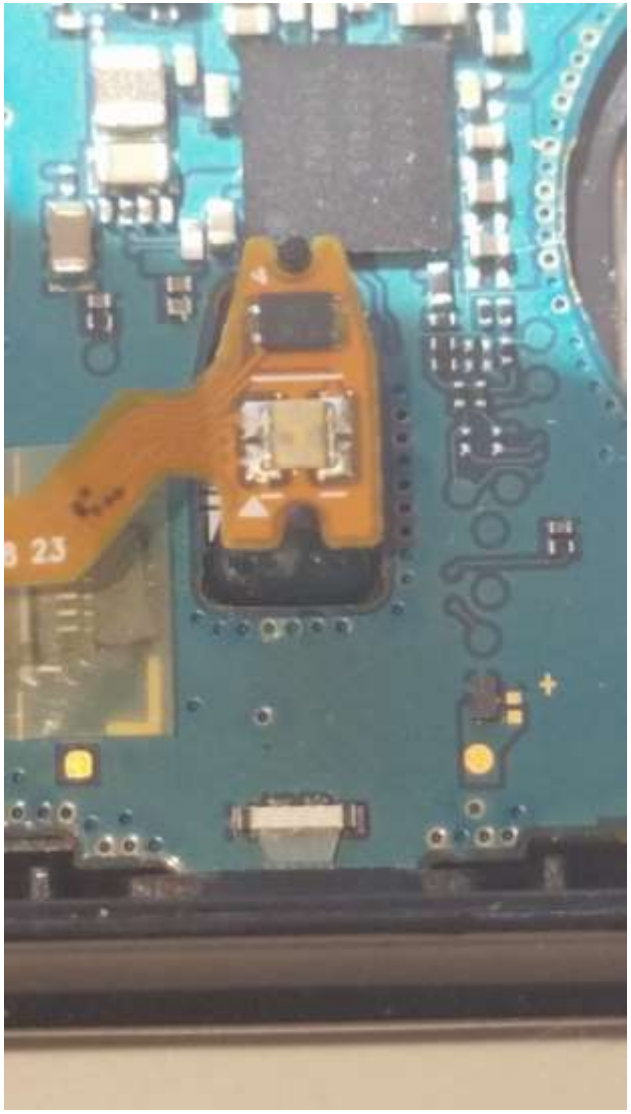
[23]

On information and belief, BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the controller and/or sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

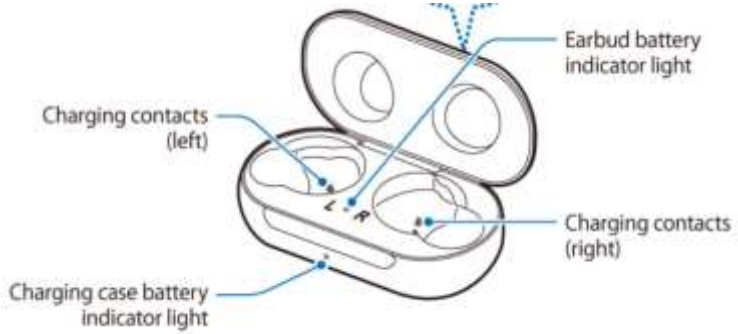
	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]

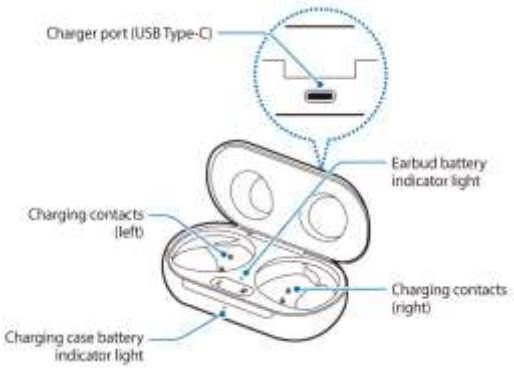
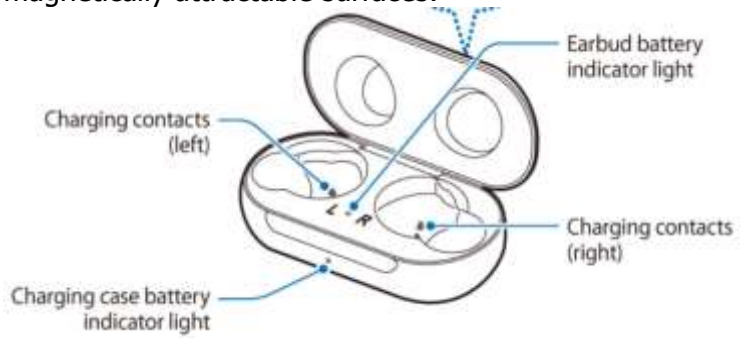

SAMSUNG
Galaxy Buds+
GALAXY BUDS+
AUDIO
BATTERY
DESIGN
CONVENIENCE
ECOSYSTEM
COMPARE
SPECS
Battery
Sensor
Compatibility

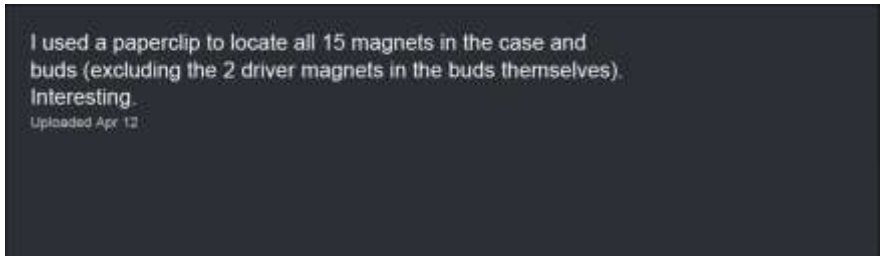
[22]

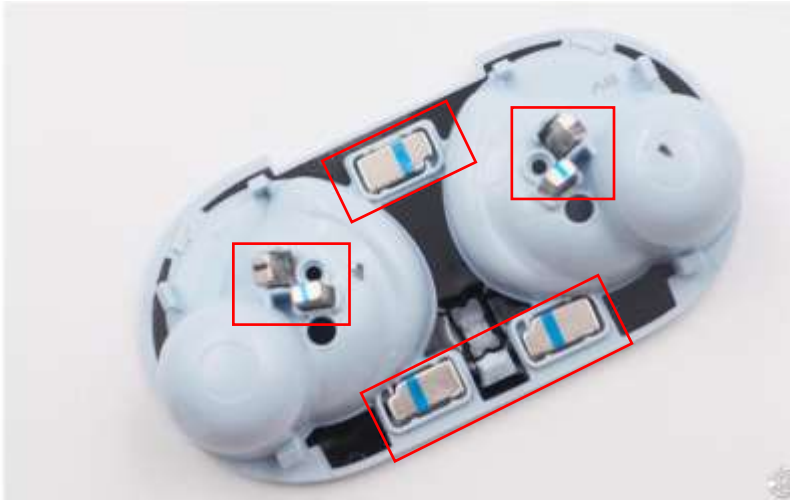
	 [23]

	Also, Samsung Galaxy Buds+ detect if one or more earbuds are decoupled from one or more of the magnets comprising the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnets comprising the holder body, audio stops. The electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one or more of the magnets. When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds+ earphones are deactivated and cannot play audio when in the holder. Galaxy Buds+ are compatible with smartphones and tablets running Android 5.0 or higher, including without limitation Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, Galaxy S10e, S20, S20+ and S20 Ultra 5G. In addition, Galaxy Buds+ are compatible with iPhone7 or later models with iOS10 of higher. [10] Compatible with smartphones and tablet running Android 5.0 or higher and with more than 1.5GB of RAM. Also compatible with iPhone7 or later models with the iOS 10 or higher. [25]

Claim 55	Evidence
55[pre]. An earphones holder comprising:	The Preamble is non-limiting. *STX LLC. v. Brine*, 211 F.3d 588, 591, 54 USPQ2d 1347, 1350 (Fed. Cir. 2000) (preamble that states a purpose or intended use for the invention is not limiting).
55[a] a holder body;	Samsung Galaxy Buds comprise a charging case:  [1] Samsung Galaxy Buds+ comprise a charging case:

	 [24]
55[b] one or more holder magnets or magnetically attractable surfaces coupled to the holder body; and	Samsung Galaxy Buds comprise a charging case with one or more magnets or magnetically attractable surfaces:  [1]

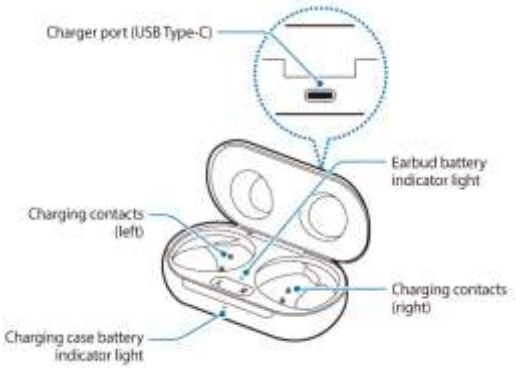
	Galaxy Buds: Features The buds' most iconic feature is their **wireless charging case**. The small, oval container snaps the Galaxy Buds into place using tiny magnets and can be placed on any Qi wireless charging mat to juice up. The S10's Wireless PowerShare lets users turn their smartphone into an extra wireless charger so that they can still charge Galaxy Buds on the go. [2] 

	 [3]
	

采用多颗磁铁辅助耳机定位。 [14]

English Translation: Use multiple magnets to assist in headphone positioning

Samsung Galaxy Buds+ comprise a charging case with one or more magnets or magnetically attractable surfaces for removably coupling with a magnetic surface of a set of earphones:



[24]

[23]

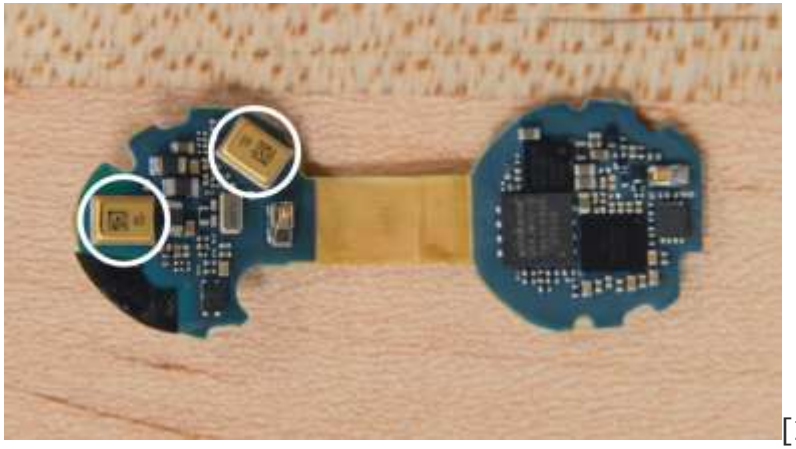
[23]

Your device contains magnets, which may affect medical devices, such as pacemakers or implantable cardioverter defibrillators. If you are using any of these medical devices, keep your device a safe distance from them and consult with your physician before you use the device. [24]

[16]


[16]

The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]


[16]

55[c] an electronic device controller for sending an activation signal to an electronic device, wherein one or more earphones magnets or magnetically attractable surfaces removably couple with the one or more holder magnets or magnetically attractable surfaces, further wherein the electronic device controller sends the activation signal to the electronic device when magnetic connection is broken between the one or more earphones magnets or magnetically attractable surfaces and the one or more holder magnets or magnetically attractable surfaces.	Samsung Galaxy Buds comprise an electronic device controller for sending an activation signal to an electronic device (e.g. Smart Phone) when one or more earphones magnets or magnetically attractable surfaces removably couple with the one or more holder magnets or magnetically attractable surfaces: **Broadcom Wireless Audio Chip Powers Samsung Galaxy Buds** **Broadcom BCM43014 delivers premium Bluetooth sound and unmatched battery life in ultra-compact footprint** SAN JOSE, Calif., Feb. 28, 2019 (GLOBE NEWSWIRE) -- Broadcom Inc. (NASDAQ: AVGO) today unveiled the BCM43014 chip enabling the Samsung Galaxy Buds to deliver a premium audio experience. The BCM43014 is a highly-integrated low power SoC that brings together unique innovations in Bluetooth, audio DSP and sensor hub technology to render rich audio while delivering up to six hours of Bluetooth streaming or five hours of voice calls. [4] Built on Broadcom's unique combination of deep semiconductor expertise and wireless audio engineering, the BCM43014 is engineered to meet the design requirements for in-ear wireless devices. In addition to Bluetooth 5, the chip is packed with innovative features and capabilities that: • Allows for seamless integration of advanced acoustic algorithms that reduce background noise to deliver rich sound. • Delivers synchronized audio to both the earbuds for various daily user scenarios using Broadcom's InConcert® technology to create a truly wireless experience. • Innovates with a holistic low power system-level design that spans radio design, protocol optimization and software techniques. • Seamlessly connects both Buds with phone and quickly switches between devices with Broadcom's advanced Bluetooth pairing technology to deliver continuity of content for the consumer. • Enables the integration of the multi-dimensional sensors behind the convenient and intuitive user interface on the Buds. • Facilitates slim earbud design by integrating multiple audio components into a single chip and reducing the overall bill of materials. [4] Galaxy Buds also comprise an ABOV F6432AUB Micro Controller Unit.

	 [14] On information and belief, the ABOV F6432AUB and the controller and/or sensor hub of the BCM43014 System on Chip are responsive to a magnetic Hall sensor:

Samsung Galaxy Buds - The Official Samsung Galaxy Site

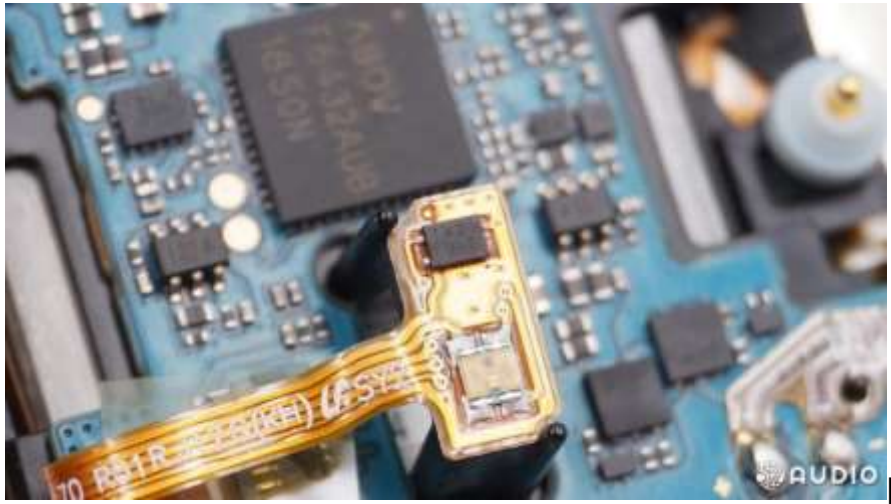
[5]

Broadcom BCM43014

Broadcom is an enormous identify within the wi-fi communications enterprise and has its personal vary of true wi-fi audio chips. The BCM43014 powers the Samsung Galaxy Buds, which had been introduced alongside the Samsung Galaxy S10 collection this 12 months.

The BCM43014 can also be a Bluetooth 5 chip, for what that's price, full with an audio DSP and sensor hub expertise for contact, IR, and proximity sensors. The chip helps quick scan and connection choices to enhance pairing pace. There's no ANC with the Galaxy Buds, however the BCM43014 mentions the combination of superior acoustic algorithms that cut back background noise, which might be out there to different items.

[10]



[14]

The smartphone is activated when magnetic connection is broken between the one or more earphones magnets or magnetically attractable surfaces and the one or more holder magnets or magnetically attractable surfaces:

[8]

Galaxy Buds automatically connects to the user's smartphone when the case is open and disconnects when placed back in the case. With a simple touch on the surface of an earbud, users can play or pause the current song, or move onto the previous or next song. Users can even give orders or turn on and off certain features using voice command.

[8]

Also, Samsung Galaxy buds detect if one or more earbuds are decoupled from one or more of the magnetically attractable surfaces attached to the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnetically attractable surfaces attached to the holder body, the audio stops.

The **Galaxy Buds** will detect how many earbuds are in its case and will switch the sound output to mono or stereo based on how many earbuds are in the charging case. If you put both **Galaxy Buds** into the charging case, the music will stop automatically.

[11]

When paired to a Bluetooth device that is playing audio, one or both Galaxy Buds earphones activate and begin playing audio when removed from the charging case.

Quick pairing out of the box

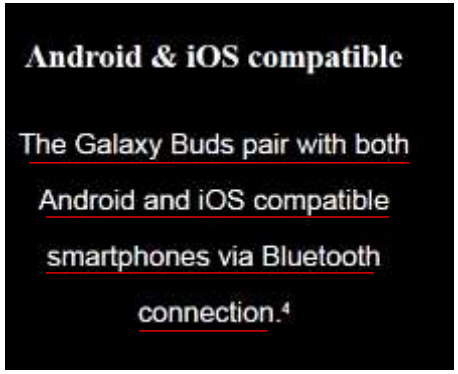
Just pop open and pair. Galaxy Buds work right out of the box, connecting with your Galaxy devices in an instant via Bluetooth to get you up to the beat and well on your way. 1,2,3

[6]

On information and belief, Galaxy Buds are compatible with Samsung Galaxy products, all of which include a controller configured to receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, and Galaxy S10e.

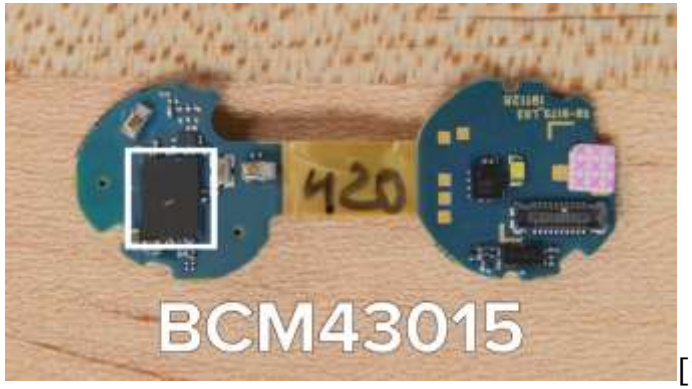
[5]

On information and belief, Galaxy Buds are also compatible with other smartphones, including without limitation Apple iPhones, which also include a controller for receiving Bluetooth signals.



[7]

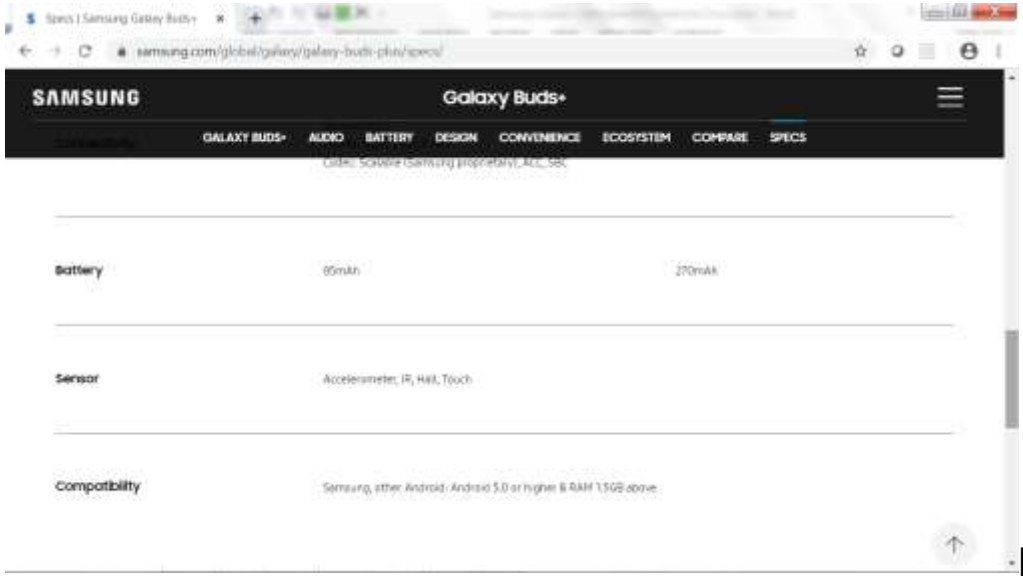
Samsung Galaxy Buds+ comprise, an electronic device controller for sending an activation signal to an electronic device when the magnetic surface of the set of earphones is decoupled from the one or more magnetically attractable surfaces, wherein the system wirelessly communicates with the electronic device:

	 [16] Galaxy Buds+ also comprise Samsung S2MUA01X chips. On information and belief, the S2MUA01X chips include a controller unit.

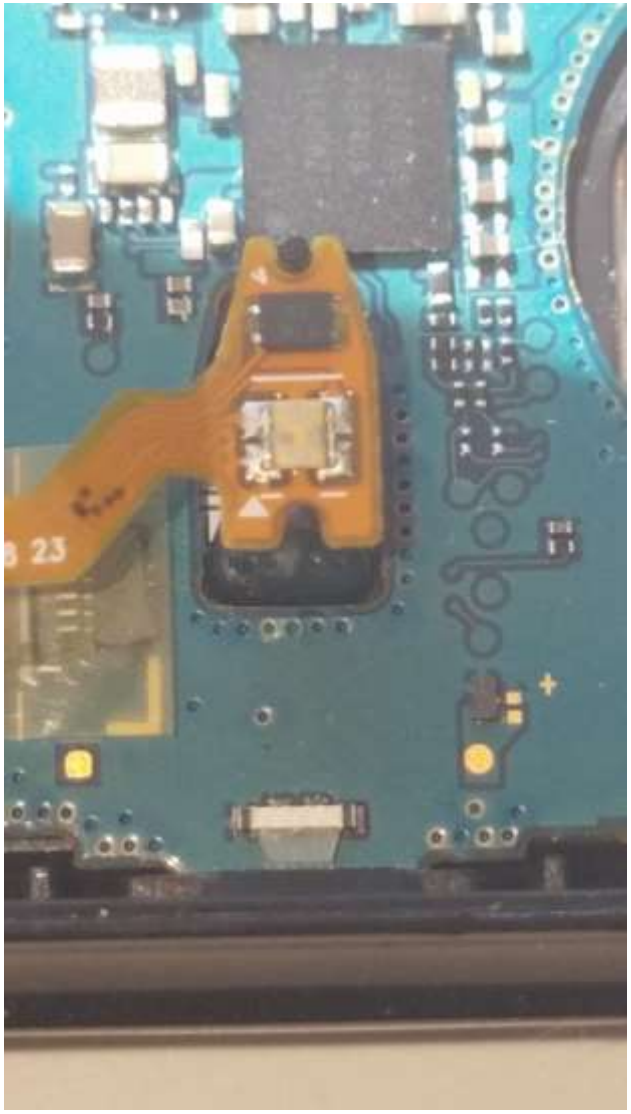
[23]

On information and belief, BCM43015 System on Chip includes a control unit and a sensor hub. On information and belief, the Samsung S2MUA01X chips and the controller and/or sensor hub of the BCM43015 System on Chip are responsive to a magnetic Hall sensor:

	The internal structure of the new Buds+ is similar to last year's model, but the 2020 entry does make better use of all of its internal space. This time, the 0.315Wh battery is supplied by EVE instead of Varta, and it, together with the main printed circuit board (PCB), reside in one half of the earbud. The other half of each earbud contains the charging contacts, an interfacing microphone, a proximity sensor, as well as the upgraded drivers which are reportedly more difficult to remove (and haven't been in the video). [17]  [16]


SAMSUNG
Galaxy Buds+
GALAXY BUDS+
AUDIO
BATTERY
DESIGN
CONVENIENCE
ECOSYSTEM
COMPARE
SPECS
Battery
Sensor
Compatibility

[22]

	 [23]

	Also, Samsung Galaxy Buds+ detect if one or more earbuds are decoupled from one or more of the magnets comprising the holder body and accordingly control the sound output in the earbuds. Further, if one or more earbuds are coupled to one or more of the magnets comprising the holder body, audio stops. The electronic device controller receives a deactivation signal when one or more of the set of earphones are coupled to one or more of the magnets. When wirelessly paired to a Bluetooth device that is playing audio, one or both Galaxy Buds+ earphones are deactivated and cannot play audio when in the holder. Galaxy Buds+ are compatible with smartphones and tablets running Android 5.0 or higher, including without limitation Samsung Galaxy products, all of which include a controller configured to wirelessly send or receive Bluetooth signals, including without limitation: Galaxy S7 Edge; Galaxy S7; Galaxy S8; and Galaxy S8+; Galaxy S9; Galaxy S9+; Galaxy Note 5Galaxy Note 8; Galaxy Note 9; Galaxy A6, Galaxy S10, Galaxy S10 Plus, Galaxy S10e, S20, S20+ and S20 Ultra 5G. In addition, Galaxy Buds+ are compatible with iPhone7 or later models with iOS10 of higher. [10] Compatible with smartphones and tablet running Android 5.0 or higher and with more than 1.5GB of RAM. Also compatible with iPhone7 or later models with the iOS 10 or higher. [25]